

# MARINE RECORD

ESTABLISHED 1878.

VOL. XX. No. 16.

CLEVELAND---APRIL 22, 1897---CHICAGO.

\$2.00 Per Year. 10c. Single Copy

## LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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### SIDELIGHTS AND SCREENS.

In the fitting out of vessels in the spring of the year, too much attention can not be paid to the proper adjusting of the sidelight screens and the lights to be exhibited. Masters and owners would do well to remember that the majority of collisions happen through the errors resulting from seeing both lights, when one only ought to be in view, and similar instances having a momentous bearing on the rules of the road. The sidelights beside being of the best quality, should be tested to show that the starboard lights has a shade or glass that will throw a clear deep green, over an arc of the horizon of ten points of the compass, and not as is frequently the case, a pale, washed out green, as it were, showing over an arc of the horizon anywhere between five and fifteen points of the compass. The port light as a rule, even an inferior article, is generally more recognizable than either a white, or yellow light, or a green light, and as so much depends on the determining of the shade, vessels navigating ought to be always fitted with the very best appliances. One lawsuit would cost more than several good sidelight outfits, and in serious cases involve the vessel which has proved culpable. Having the proper lights, the question of screening them must be strictly attended to so that the green light shall not be seen to port, or the red to starboard, and yet allow both lights to be clearly in sight to anything end on. To obtain this view it is only necessary to place the light on a line parallel with the line of keel, and by having inboard screens projecting three feet forward of the light they will never show across the bow.

We have presumed that the shades of the lamps were cut to show  $112\frac{1}{2}^{\circ}$ , no more or less, yet it is barely possible that sidelights are now being carried that have not been constructed according to this principle. Of course the majority of the lights and those constructed by reliable makers are perfectly correct, yet we cannot but think that there are still some old, inferior lights in use which are not quite up to the regulation standard either in construction, size, or quality, and if it is added that they may be sometimes imperfectly placed on shipboard, we may readily see that collision, bringing trouble, expense, and perhaps loss of life in their train, are sometimes courted unwittingly; under any circumstances there is no technical or legal excuse for the neglect to carry proper lights, and any vessel so offending the laws of the rules of the road is liable to pay the piper in all cases of carelessness, and we think she honestly deserves to be at the expense, or outlay caused by her collisions, or more correctly, by the incompetency of those on board. If instead of each party paying their own losses, as is frequently the case, the cul-

pable vessel was mulcted in heavy damages, we venture to say that there would be a perceptible decrease in the number, and the importance of the collisions of which we hear from time to time, and by bringing the wrong-doers to justice a salutary lesson would be given to others who are engaged conducting valuable property across the waters, besides having charge of the lives of a number of their fellow men, who trust implicitly to the competency of their superiors in the craft or skill of seamanship.

### MUD LAKE OPENING UP.

Information to hand says that Mud lake is open to the head of Lime Island. There are only about one and one-half miles of ice at the foot of the island, which is soft. Boats will have very little trouble in breaking through it and reaching the Soo.

### INSPECTOR LEUTZ.

Commander C. H. C. Leutz, who will succeed Commander J. H. Dayton as inspector of the ninth light-house district, will take up the office May 1. He is accompanying Commander Dayton on a trip over the district in the lighthouse tender Dahlia, which is engaged in placing the buoys in the district. Commander Leutz comes from the man-of-war Michigan, which has been doing survey work for the navy department for some time. Commander Dayton will be placed on waiting orders.

### A STATION AT THE "SOO."

In less than a year it is reported that the light-house board will establish a supply depot near the straits region for the storage of coal, buoys, oil, gas and other light-house department supplies of all description. Though it will be on a much smaller scale than the depot in Detroit, Cheboygan, Charlevoix and Sault Ste. Marie are anxious to secure it. The claims have been considered, and it is said the board will probably decide in favor of Sault Ste. Marie, as being the most central point for access from Lakes Huron and Superior, and as being a town large enough to furnish such material as may be needed in case of emergency, besides holding, near at hand, all the labor that may at any time be needed.

A depot of this character has long been needed. At present the large number of light stations in the upper part of the eleventh district have to depend on the Detroit river for their supplies, which are carried up in tenders. The local depot is large enough, but the distance to be traversed, 250 to 500 miles, according to the destination, is too great and the time consumed in getting over it too valuable. For instance, when the light at Stannard Rock, Lake Superior, needs coal and oil, the tender, which may be up the lakes on inspection at the time, will have to go only to the Soo—if that site is chosen—instead of going back to Detroit for them.

The Canadian Marine Association met in Toronto recently, President R. O. Mackay, Hamilton, in the chair. A committee was appointed to proceed to Ottawa and lay several requests before the government, the principal being that the government in future refuse permission to any one to build a bridge across navigable waters. The government will also be asked to keep the bridge across the Murray canal open on Sundays. The contention of the vesselmen in this is that the Murray canal was constructed to allow vessels passage by the way of the Bay of Quinte when it was too stormy to go out into the open lake, and that the closing of the bridge on Sunday does away with a great deal of the value of the route. They would also like the duty on manilla cordage reduced to about 1 1-2 per cent, the same as prevails in the case of binder twine.

### NOTICE TO MARINERS.

Correction of Notice to Mariners No. 45 of 1897.  
UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—WISCONSIN.

Treasury Department,  
Office of the Light-House Board,  
Washington, D. C., April 19, 1897.  
STURGEON BAY CANAL SOUTHEAST ENTRANCE LIGHT, No. 1.

Notice is hereby given that the color of this light, on the northeasterly side of the entrance to Sturgeon Bay Canal from Sturgeon Bay Harbor of Refuge, will remain white, instead of being changed as stated in Notice to Mariners No. 45 of 1897.

### DETROIT RIVER.

#### BALLARD REEF CHANNEL GAS BUOYS.

Notice is hereby given that, on April 8, 1897, gas buoys, as follows, were established on the westerly side of the Ballard Reef Channel; Detroit River, in lieu of the float lights heretofore maintained by the Lake Carriers' Association. The buoys are on a line parallel with and about 350 feet to the westward of the Grosse Isle South Channel Range line.

South Gas Buoy, No. 1.—A black, third-class buoy, showing a fixed white light, in 22 feet of water, about 5,000 feet (15-16 mile) N. by W. 1-2 W. from Limekiln Crossing Light Vessel (North), No. 65. Head of Bois Blanc Island Range Front (Canadian) Light House, S. 3-16 E.; west end of railroad bridge between Grosse Isle and Stony Island, SW. by W. 3-8 W.; Grosse Isle North Channel Range Front Light House, N. by W. 15-16 W.

Middle Gas Buoy, No. 3.—A black, third-class gas buoy, showing a fixed white light, in 22 feet of water, about 1,200 feet N. by W. 1-2 W. from South Gas Buoy, No. 1. Head of Bois Blanc Island Range Front (Canadian) Light House, S. 3-8 E.; west end of railroad bridge between Grosse Isle and Stony Island, SW., 3-8 W., westerly; Grosse Isle North Channel Range Front Light House, NNW.

North Gas Buoy, No. 5.—A black, third-class gas buoy, showing a fixed white light, in 22 1-2 feet of water, about 1,200 feet N. by W. 1-2 W. from Middle Gas Buoy, No. 3. Head of Bois Blanc Island Range Front (Canadian) Light House, S. 7-16 E.; west end of railroad bridge between Grosse Isle and Stony Island, SW. 3-8 S.; Grosse Isle North Channel Range Front Light House, NNW., westerly.

Mariners are requested to exercise great care to keep clear of these buoys, as there is a natural set of the current to the westward in this part of the channel. Tows and rafts should be handled with especial care. These buoys are difficult to reset when once removed.

This notice affects the "List of Lights and Fog Signals, Northern Lakes and Rivers, 1896," page 26, after No. 12555, and the "List of Beacons and Buoys, Northern Lakes and Rivers, 1896," page 39.

By order of the Light-House Board:

W. S. SCHLEY,  
Captain, U. S. Navy, Chairman.

Soundings taken on the bar at the mouth of Sandusky bay shows that the water there ranges from fifteen feet eight inches to nineteen feet. A dredge at work along the water front at that port will within a few days begin the work of removing the bar entirely, making the depth of water at the entrance of Sandusky bay about twenty-five feet.



## NEWS AROUND THE LAKES.

## DETROIT.

Special Correspondence to The Marine Record.

The steamer Frank E. Kirby commenced running this week, and will leave this port on alternate days until about June 1st, when a daily service will be given. Ashley & Dustin are managers of the line, as formerly.

Vessels owners are not at all pleased over the wild ore contracts which have been made. Forty cents from Escanaba to Lake Erie ports and 65 cents from Marquette to Tonawanda are extremely low figures for the opening of the season.

The Flint & Pere Marquette railroad train leaving Fort street, Union station at 1:20 p. m., now makes direct connection at Ludington with its own line of steamers for Milwaukee, where connections are made with all railroads for the northwest.

Col. Lydecker, Corps of Engineers, U. S. A., answers Capt. McDougall, who claims that there will never be a 20-foot channel, as the deeper cuts run the water off so much faster, by saying that if the water were leaving Lake Superior faster than before, the level would be lowered, whereas it is higher now than for many years back. The colonel admits that in the immediate vicinity of a deep cut like the Limekilns channel the water is lowered, but that the fall above this cut has a limit and does not extend beyond it. For instance, he thinks that the lowering of the level at Ballard's Reef was caused by the Limekilns cut, but he says it does not run up as far as Detroit. The colonel, who has just returned from an inspection trip of the St. Mary's River improvements, says that all the work of the deep channel project is finished in that river except the removal of a few riverbed projections left by the dredgers and blasters last fall, and which are now being located by sweeps and removed. Before the end of the season all of these projections, which are below the canal, will have been taken away.

## CHICAGO.

Special Correspondence to The Marine Record.

The Lake Michigan & Lake Superior Transportation Co. began receiving freight for Lake Superior points this week.

All the grain offered for shipment this week was taken by the lines for their waiting steamers. The Buffalo corn rate was  $1\frac{1}{8}$  and  $1\frac{1}{4}$  cents.

The Huron Line steamers City of Fremont and F. & P. M. No. 1 has resumed their daily trip schedule between Milwaukee and Chicago.

One boat was chartered for corn to Buffalo on Monday at  $1\frac{1}{4}$  cents. The lines were reported to be taking corn in some instances at  $1\frac{1}{8}$  cents. Little grain was offered at any price.

The Sheriffs Manufacturing Co., of Milwaukee, has just shipped two wheels, one 8 feet and one 8 feet 6 inches in diameter, to New Orleans; also a 6-foot wheel to Fitzsimmons & McConnell, of this port.

On Saturday, under the pressure of the line boats seeking cargoes of grain, rates dropped first to  $1\frac{1}{4}$  cents and then to  $1\frac{1}{8}$  cents on corn to Buffalo. The John Emory Owen was placed for wheat to Buffalo at  $1\frac{1}{4}$  cents.

The excursion steamer Macatawa, Capt. Oliver W. Landreth has been chartered by the Riley Trans. Co., of South Chicago, to carry passengers and freight between Chicago, South Chicago, Hammond, Riverdale and Hegewick. The Macatawa will leave her dock at Harrison street bridge every evening at 7 o'clock.

Henry Finch, the new keeper of the Milwaukee life saving station, and his crew are at work at the station preparing for the season. It is expected everything will be in readiness this week. Charles Johnson is a new member of the crew. The other men at the station, besides Capt. Finch, are Frank Gerdes, Charles Garland, Henry Sinnegan, William Peterson, John Allie and Julius Meyer.

The fishing tug Charm has been libeled at Kenosha by U. S. Marshal Pratt, for a claim of \$350 held by the owners of the steamer S. S. Curry. Last October the tug Charm went out to look after her nets. She got disabled, and rolled about for an entire day before sighted by the Curry. In that time the crew had become so stiffened with the cold and lack of food that they were almost helpless. The steamer took her in tow and brought her into Chicago harbor. The bill of \$350 was for this tow.

The southwest gale Sunday put an embargo on commerce on Lake Michigan. Everywhere vessels were forced to seek shelter from the heavy wind and sea. A few vessels started out for the Straits during the night and in the morning, but for them the wind was favorable, and the following seas not nearly so dangerous as to vessels bound up the lake. The water was lowered in Chicago and Calumet Rivers two and one-half feet. Boats were on the bottom in both places, and the high wind made it very difficult to handle a big steamer at all.

A double launch will take place at the yards of the Chicago Shipbuilding Co., on the Calumet, Saturday, April 24. The two boats are the twin steamers Minneapolis and St. Paul. The Minneapolis will be the first to go into the water, her launch taking place at 2:30 o'clock in the afternoon. The St. Paul will follow an hour later. The two boats are known in the yard as numbers 27 and 28. Their

berths in the stocks are side by side, and each ship is in every particular the exact duplicate of the other. The idea of launching both on the same day is a novel one, and such an event rarely takes place.

C. L. Hennig, the collector of customs at South Chicago, submits some very interesting figures of the business done last year. He says: "Last year we shipped 22,000,000 bushels of corn, 14,000,000 bushels of oats, 4,000,000 bushels of wheat, and 3,000,000 bushels of barley, besides 60,000 tons of steel rails and 40,000 tons of steel billets, to say nothing of innumerable other freights, making altogether 1,800 of the largest cargoes on fresh water. We received here 1,500,000 tons of ore, over 500,000 tons of coal, 80,000,000 feet of lumber, and about 700,000 barrels of salt. We also exported to Canada over 2,000,000 bushels of corn, 500,000 bushels of oats and wheat, 20,000 tons of steel rails, and about 10,000 tons of other manufactured iron."

Lincoln Park Yacht Club members are ready to join the Yacht Union of the Great Lakes. At the annual meeting of the club, Commodore E. C. Berriman was elected a delegate to the Lake Michigan Yachting Association, which meets at Racine on April 24, and was instructed to advocate the association joining the union, and if the association did not desire as a body to join, it was the sentiment of the meeting that the Lincoln Park Yacht Club join as a club. Without membership in this organization Chicago yachtsmen are not in a position to challenge for an international contest, and are debarred practically from the big events on Lake Erie and Lake Ontario. The opinion in regard to joining the union was unanimous.

Within a few days all the Goodrich line steamers, with the exception of the Virginia, will be on their regular routes for the season. The west shore is at present covered by the City of Racine, the Indiana and the Atlanta, which will continue on the run all season, from Chicago to Milwaukee and as far north as the Sturgeon Bay Canal. The City of Ludington will go on her old run from Chicago to Green Bay Menominee, and as soon as the weather permits to Gladstone, Manistique and other ports. The Iowa will continue on her present run from Chicago to Grand Haven, and Muskegon. Last season she did a large business on this route. The side-wheel steamers Chicago and Sheboygan will be placed on the Escanaba run, and will also visit Green Bay as soon as business warrants. The Virginia will take her place on the Chicago, Milwaukee run in the excursion business, making her first trip about June 1.

## CLEVELAND.

Special Correspondence to The Marine Record.

Capt. John Mullin, ex-Mayor of Amherstburg, visited this port during the week.

Capt. Johnson of the steamer I. W. Nicholas has discharged the crew and will await orders. The Nicholas is at Erie.

The steamers Cort, Ericsson, and Queen City cleared for Duluth, light, but they will not get away before Saturday or Monday.

The steel steamer Andrew Carnegie, of the Wilson fleet, is on her first trip. She was drawing fifteen feet forward and fifteen feet four inches aft, and had on 5,300 tons of cargo and 250 tons of fuel.

Capt. John Ward qualified this week as master of the steamer Henry Cort, Capt. H. L. Mills as master of the steamer Queen City and Capt. H. W. Stone as master of the steamer Ericsson.

It is likely that three of M. A. Bradley's boats—the Fred Kelley, Sandusky, and Thomas Quayle—will not go into commission very early this season. Their crews have been selected, but the owner does not now feel certain that he will send them out until freights pick up.

Mr. J. R. Parker, last season chief mate of the John Harper, wintered in Tampa, Fla., and has returned to go mate this season on the Alex. Nimick, owned by the American Transportation Co., G. E. Tener, manager. Capt. D. R. Wright is in charge of the Nimick this season.

Vessel owners and brokers are looking around for first loads from Escanaba, but shippers are not ready yet to talk business. The indications are that the wild rate will open at 40c. The coal freight market is very dull and no charters reported worth speaking of, although boats for the head of the lakes are offered at 20c.

Capt. Arthur H. Hawgood, well known to all local vesselmen, has received an appointment to succeed the late Capt. Martin as manager of the Flint & Pere Marquette Line at Ludington. We are more than sorry to lose Capt. Hawgood, but presume that our loss is his gain. On the other hand, it is certain that the captain will reflect credit on his friends wherever he goes.

## PORT HURON.

Special Correspondence to The Marine Record.

The water at this end of Lake Huron is a foot higher than it was at this time last year. Since December the rise has been steady. The lake level usually rises from April to June and in the latter month reaches a height of six inches greater than in April. If this takes place this year vessels will be able to load to a draft of over 16 feet through St. Clair River, which will materially increase the carrying capacity of the largest boats.

## BUFFALO.

Special Correspondence to The Marine Record.

Capt. John Mitchell has ordered the steamers McWilliams, John Mitchell and Lagonda tied up here as soon as they discharge their grain cargoes.

The steamer Tom Adams was libeled here on Wednesday on a claim for \$10,000 by a sailor, who claims to have been injured on the steamer last season.

There is nothing new in the freight situation. Grain rates from Chicago to Buffalo are gravitating toward the 1-cent mark, and there isn't enough up-bound coal in sight to raise a dust.

The steamers City of Paris, City of Venice and Rappahannock were placed for coal for Duluth at 20 cents, and the Sam Marshall and tow for Milwaukee at 25 cents. The latter tow will hold their cargoes until May 1.

Official notice has been received that the Erie Canal would open for navigation on Saturday, May 8, at 12 o'clock noon. Twenty boats loaded with grain are awaiting the opening at this port. Shippers say that the outlook for the season on the canal is exceedingly poor. Forwarders are asking  $3\frac{1}{4}$  cents on wheat to New York, but no contracts are being made.

Eugene Hughes, of Hughes Bros & Bangs, the Syracuse contracting firm which is to build the new breakwater, was in Buffalo this week. He stated that arrangements for beginning the work as soon as navigation opens are practically completed. Part of the firm's plant is at the Soo and cannot be brought here until later. A big clam shell dredge is being built for the deep water work. It will not be completed until next year. Most of the gravel dredging will be done with ordinary dredgers. The first work will be done on the rubble-mound elevator. Mr. Hughes was unable to state how many men will be employed at first. The number will be increased from time to time.

The excursion steamer Vision, owned by Sloan & Cowles, of this city, has again been chartered for the season by New York parties. The Vision will make two trips, morning and afternoon, between the Battery and Bath Beach, and during the day and evening will run from Jersey City and Hoboken to Bay Ridge in connection with the railroad to Coney Island. The excursion steamer Pilgrim, which many Buffalonians will remember, is now in Portland, Me., where she is owned. Mr. Cowles said that her forward awning deck has been built out to her stem and that while now in the ocean trade she is allowed 200 more passengers than when she was in the lake and river service here.

When talking over freights, Capt. J. J. H. Brown was asked if the dull opening of this season was any particular exception to the general rule. The cry of "nothing doing" and "got to lay up" has for years been the regular accompaniment of the opening of navigation. "I don't remember any season but one that started out as dead as this," said he. "That was in 1879. For three months, nearly, things all went to pot and there didn't seem to be anything in sight. Then business picked up, and, Great Scott! how it did hum the rest of the season, after July 1. I sincerely hope this year will be a repetition, but it is safe to say that this is the worst start off for vesselmen since 1879."

Capt. Cooney ran the Garden City in the Crystal Beach Line here last summer and was the only captain of a Canadian excursion boat who ever was able to affiliate on congenial terms with the masters of Buffalo steamers and tugs. The lot of the usual run of boats and alien captains who ply on ferry licenses from here is not generally a happy one, but Capt. Cooney won the whole outfit and there isn't a Buffalo pilot who wouldn't give him the glad hand. An attempt was made this week at Port Dalhousie to burn the Garden City, and the local mariners are speculating as to whether the atmosphere in Canada turned blue or red when Capt. Cooney heard of the plot, for his vocabulary of invective is of fierce and varied hues. Capt. Cooney's triumphant exit from Buffalo last fall is well remembered. The Garden City was to be libeled and Capt. Cooney found it out. He then lit out of port wide open and never checked down until his boat was safely moored at Port Colborne.

## DULUTH.

Special Correspondence to The Marine Record.

The passenger boats this season will leave Duluth at 1:30 p. m. on Saturdays and Tuesdays, and arrive Friday and Monday evenings at 6:30, making a stay of nineteen hours in Duluth. The boats will arrive in Buffalo at 9 a. m., and leave at 9:15 p. m. of the same day.

The new lake and rail route which will be established between the head of the lake and Montreal via Lake Superior, Georgian Bay, Perry Sound and the Canada Atlantic railway, will, it is generally believed, be an important factor in the matter of freight rates between this place and the seaboard.

The launching of the Constitution, the new boat at the yards of the Steel Barge Company in this city, which was to have taken place on Saturday afternoon, has been postponed until Wednesday at 5 o'clock. The officials of the Barge company experienced some delay in preparing for the launch and it was necessary to postpone it for a few days.

In addition to the Rockefeller fleet of eighteen vessels,



the management of the Carnegie mines will have four other vessels engaged regularly the coming season in moving ore to Lake Erie ports. It is presumed these four vessels, the Harper, Nimick, Tyrone and Antrim, will bring return cargoes of coal for the Youghiougheny & Lehigh Coal Company.

It is now believed that a new line of steamers will be put upon the lakes, to be operated upon this course, about July 1, as the flour sheds and merchandise docks are now being constructed at that end of the line will not be ready before that time. The transportation men at the head of the lake are generally pleased with the outlook and they are of the opinion that when the new route shall have been established there will be a large reduction in the matter of rates.

The passenger and freight boats of the Northern Steamship Company will land hereafter at the foot of Fifth avenue west, Duluth, the lease of the Duluth Transfer warehouse having expired. The three-story brick block on the Fifth avenue dock, formerly occupied by Wells-Stone Mercantile Company, has been leased, together with dock room sufficient for the company's purposes. The purchasing department of the line will be located there, as well as the other local departments. The building will be altered to suit the demands of its new occupants.

There will be a big grain fleet to leave here for Buffalo when the word comes that navigation is open at the Soo. Already there are about 800,000 bushels of wheat afloat, and it is expected the amount will be increased to 1,550,000 bushels in ten days at which time it is expected the season will have begun. Pickands, Mather & Co. have placed whalebacks for 700,000 bushels of Superior wheat at 2 cents. All told, there have been chartered between 3,500,000 and 4,000,000 bushels of wheat to go forward, of which amount 1,500,000 bushels will go to other ports than Buffalo. The rates range from 2 1-2 cents down to 1 3-4 cents.

The steamer Rees, which wintered at Superior, will be the first boat of the season to depart from the head of the lakes. She cleared on Saturday afternoon for Washburn, where she will load wheat, and from there she will go to Buffalo. The Northern Light was the first boat to clear from the head of the lakes last year. She left here April 24. There are a number of other boats now anchored in the Superior and Duluth harbors that are anxious to clear. There are now at the head of the lake harbor about six which are loaded with flour and the only thing that prevents them from going out is fear of the opening of the Soo at the required time.

It is of general interest to note that there is a great difference between the present depth and draft of vessels of last year. This year the depth that vessels may safely load to is sixteen feet, while last spring at the opening it was thirteen feet six inches. Vessels now loaded with wheat in the Superior and Duluth harbors are the Coralia, 153,060 bushels; La Salle, 82,248 bushels; Zenith City, 160,000 bushels; barge 107, 95,000 bushels; barge 105, 100,000 bushels; barge 129, 104,352 bushels; barge 104, 101,000 bushels; barge 133, 106,492 bushels; Trevor, 109,700 bushels, making a total of 1,018,852 bushels. The steamer Iosco is loaded with 89,406 bushels of flax.

Of the 1,108,258 bushels of grain afloat in the harbor practically all of it is wheat. Before the fleet commences to move this amount will be materially increased, perhaps by 250,000 bushels. The last of the fleet of grain boats expects to get away from here Tuesday. The Rees in all probability will be the first boat of the season to pass through the locks. It will be a matter of interest to watch for the record breaking cargoes this spring. The big steamer Queen City now holds the medal for Lake Superior and Lake Michigan, and her owners propose that she will hold it again this season. The Queen City, as will be remembered, broke all records when she carried 156,256 bushels of barley and 58,000 bushels of wheat, which is equal to 5,400 net tons, from the head of the lake to Buffalo last fall. The Queen City also holds the record for the heaviest cargo out of Chicago, having taken a load weighing 6,210 net tons out of that place last summer. The conditions this season for large cargoes will be better than last year for the reason that the channels have been deepened in a number of places since last fall.

#### FLOTSAM, JETSAM AND LAGAN.

A draft of fourteen feet will probably be allowed in the Welland canal this season.

A red spar buoy has been placed off the north end of Isle aux Peches, Lake St. Clair.

The Manistee Transit Company has leased the steamer Bon Voyage to make the daily runs between Menominee and Manistee.

A new chart of Green Bay and approaches, corrected to March 1, has been published by the United States Hydrographic office.

Both channels of the Straits of Mackinaw are now open, according to a telegram received by General Manager Carter, of the D. & C. line.

The steamer Wyoming, rebuilt this winter at Algonac, was re-launched on Monday. Capt. Joseph R. Inches will have charge of her this season.

The steamer M. H. Boyce is under charter to Eber Ward, who will run her in his line between Duluth and Buffalo in the package-freight trade.

Capt. Joseph Russell is in command of the steamer F. & P. M. No. 4. Capt. Frank Dority, who brought out one of the Ann Arbor carferry steamers and who last

season commanded one of the Shenango carferries on Lake Erie, has been assigned to the command of the big carferry Pere Marquette.

John Cowan has secured the steamer Lizzie Madden and consort Noquebay for lumber, Menominee to Buffalo, at \$1.25 per 1,000 feet. This is one of the lowest rates ever reported.

Capt. Matt Lightbody, of the steamer City of Alpena, is seriously ill at his home at Detroit of pneumonia. Capt. Sliffield will be in charge of the Alpena, pending Capt. Lightbody's recovery.

The Chase Machine Company, of Cleveland, has begun suit at Sandusky against the schooner Charles Wall to recover \$250, alleged to be due for supplies and work on the vessel. The Wall was seized pending the settlement of the claim.

The lights on the lightship in Lake St. Clair and those along the channel of the St. Clair River, extending to Port Huron, are again in commission. The buoys are also in place and boats can make the trip from Detroit to Port Huron in safety.

Capt. David Cochrane will this season command the Goodrich line sidewheel steamer Sheboygan, which has, during the winter, received a thorough rebuild as well as extensive repair work upon her engine, the entire cost of which is placed at \$40,000.

Sunday trips will be resumed by the Fall River Line, commencing next Sunday, April 25th, while the leaving time from New York will be 5:30 p. m. instead of 5 p. m., as at present, commencing on the same date. The Priscilla and Puritan are in commission.

In the enforcement of Sault river regulations during the coming season, the new revenue cutter Gresham, Capt. Davis, will have as tenders two fast steam launches, each in charge of an officer. The launches will do the patrol work, taking orders from the Gresham as conditions require.

The Donnelly Wrecking & Salvage Co., Kingston, has purchased the wreck and salvage (including all the equipments and outfitings saved) of the propeller "Acadia," wrecked on the north shore of Lake Superior in September last.

A London dispatch says: "In the House of Commons Secretary Chamberlain announced that a contract had been signed between the Canadian Government and the Pattersons, of New Castle, for a fast steamship service between Canada and Great Britain. The contract still requires the sanction of the Imperial Government."

The steamer Lora, which has undergone lengthening and other important improvements at the Milwaukee Dry Dock Company's south yard during the past winter, will be known by that name no longer. She is now the Alice Stafford and her port of hail is Milwaukee. The steamer belongs to the Soo line, and will ply between Gladstone and Georgian bay in connection with the Canadian Pacific railway. The capacity of the craft in her enlarged form and with the additional room gained by the removal of one of the two boilers which she had been carrying, is placed at 600 tons.

Col. Lydecker, United States Engineer in charge of the canal lock and other government improvements in the Sault river, is giving personal attention to the completion of the dredging contracts and to direction as to the parts of the work that are to be hurried, so as to provide the greatest possible draft of water early in the season. Some arrangement will also be made at the Sault so that special care will attend telegraphic announcements regarding the draft of water through the river and canal. It is the intention of the government officials to give the vessels full benefit of the available draft, but groundings and accidents of all kinds that cause expense and delay must be avoided as far as possible.

#### APPOINTMENT OF OFFICERS.

Following are the masters appointed to the principal vessels of the James Davidson line: Anomattox—Capt. Stevenson; Rappahannock, Capt. Olson; Sacramento, Capt. Mansfield; Nicaragua, Capt. Coleman; Algeria, Capt. Olsen; Armenia, Capt. Murphy; Grenada, Capt. George Starkey; Paisley, Capt. Charles Starkev.

The following have been appointed officers on the Dominion government cruiser Petrel: Captain, Ed. Dunn; first mate, A. J. Frame; second mate, F. Arnold Jarvis; chief engineer, A. J. Brown; second engineer, W. H. Linter.

The St. Lawrence & Chicago Steam Navigation Company, John H. Haggerty, manager, Toronto, Ont.: Steamer Algonquin—Captain, James McMaugh; engineer, Jas. H. Ellis. Steamer Rosedale—Captain, James Ewart; engineer, Richard Childs.

Canadian Pacific Steamship Company, Owen Sound, Ont.: Steamer Manitoba—Captain, E. B. Anderson; engineer, Robt. Kenny. Steamer Athabasca—Captain, Geo. McDougall; engineer, Wm. Lockerbie. Steamer Alberta—Captain, Jas. McAllister; engineer, A. Cameron.

The Mathew's line officers, Toronto, Ont.: Steamer Niagara—Captain, James Morgan; engineer, John Grav. Steamer Clinton—Captain, John Boyce; engineer, P. J. Carr. Schooner Emerald—Captain, John McCribbon. Clara Youell—Captain, W. J. Colwell. Lisgar—Captain John Fahey. Grimsby—Captain, Grant Horne.

The North Shore Navigation Company officers, Collingwood, Ont.: Steamer City of Collingwood—Captain, W. J. Bassett; engineer, C. Robertson. Steamer City of

Midland—Captain, F. X. La France; engineer, W. Whipps. Steamer City of Toronto—Captain, A. C. Cameron; engineer, D. McQuade. Steamer City of Parry Sound—Captain, E. Walton; engineer, J. L. Smith.

The Toronto Ferry Company steamers: Primrose—Captain, C. Tafford; mate, H. Cotter; engineer, H. Brownley; second engineer, J. Armstrong. Mayflower—Captain, Geo. Moulton; mate, M. Livingston; engineer, S. A. Mills; second engineer, J. Pickard. Shamrock—Captain, T. Jennings; mate, T. Churchill; engineer, E. Abbey. Thistle—Captain, A. Martin; mate, N. Osborne; engineer, C. Lerally. Kathleen—Captain, J. Fertile; mate, McLaughlin; engineer, Paddy Carr. Gertrude—Captain J. Tymon; mate, P. M. Oslen; engineer, Wm. Hopkins. Island Queen—Captain—J. Titus; mate, Olwood; engineer, T. W. Wood. Luella—Captain, T. Hinton; mate, Wm. Joice; engineer, John Smiley. J. L. Edwards—Captain, Wm. Scott; mate, Henry Brown; engineer, Jno. D. McGinnis. Arlington—Captain, H. Farr; mate, Ed. Lawrence; engineer, J. Wesley. Mascott—Captain, Henry Forio; mate, Henry Hanna; engineer, Wm. Flood.

Bessemer Steamship Company, Cleveland: Steamers: Sir Henry Bessemer—Captain, E. M. Smith; engineer, Richard Masten. Sir Wm. Siemens—Captain, R. E. Byrns; engineer, J. W. McEchron. James Watt—Captain, F. W. Stenton; engineer, Frank Warner. John Ericsson—Captain, H. W. Stone; engineer, R. L. Lawson. Sir Wm. Fairbairn—Captain, C. G. Ennis; engineer, S. W. Armstrong. Robert Fulton—Captain, N. B. Nelson; engineer, J. B. Hayward. Geo. Stephenson—Captain, John Lowe; engineer, H. J. Reynolds. James B. Neilson—Captain, C. E. Moody; engineer, E. W. Fox. Henry Cort—Captain, John Ward; engineer, Bernard Woods. Schooners: Sir Joseph Whitworth—Captain, H. A. Byrns. John Scott Russell—Captain, L. C. Cole. Alexander Holley—Captain, Peter Peterson. Geo. H. Corliss—Captain, Harry Gunderson. Alfred Krupp—Captain, Wilbur Holdridge. James Nasmyth—Captain, W. J. Hunt. Sir Isaac L. Bell—Captain, A. McArthur. Sidney G. Thomas—Captain, W. B. Clendenin. W. Le Baron Jenney—Captain, —.

M. A. Bradley, Cleveland: Steamers: Alva—Captain, J. H. Wysoon; engineer, J. N. Kirby. Geo. Stone—Captain, M. Mulholland; engineer, Edwin Black. Hesper—Captain, Paul Howell; engineer, P. H. Doyle. Passadena—Captain, L. Stough; engineer, J. H. Gilbo. Gladstone—Captain, Henry Peterson; engineer, J. F. Mahaney. M. B. Grover—Captain, W. E. Morris; engineer, Richard Mahoney. City of Cleveland—Captain, C. H. Francke; engineer, John McCaffrey. Henry Chisholm—Captain, P. H. Smith; engineer, C. W. Eaton. R. P. Ranney—Captain, J. H. Holmes; engineer, A. R. Crook. E. B. Hale—Captain, Jas. Lawless; engineer, A. L. Eggart. J. S. Fay—Captain, Dick Neville; engineer, Robt. Simpson. Fred Kelley—Captain, —; engineer, —. Superior—Captain, S. C. Allen; engineer, —. S. E. Sheldon—Captain, E. Saveland; engineer, G. F. Hunt. Schooners: Adriatic—Captain, A. B. Keller. John Martin—Captain, S. W. Gould. D. P. Rhodes—Captain, Ino Bridge. A. Cobb—Captain, N. Gifford. Sandusky—Captain, —. Thos. Quayle—Captain, —. Negaunee—Captain, A. B. Parsons. Southwest—Captain, Fred Green.

The officers in charge of the tug Ames, of the Lake Michigan Carferry Transportation Company this season are as follows: Captain, Ed. Evans; mate, James Parker; chief engineer, Samuel Davis; second engineer, A. Rash. Captain Robert Emerson is in command of carferry barge No. 2 and Capt. Alex Leath is in command of the No. 3, in place of Captain John Wall, resigned. The Nos. 2 and 3 will be in the Ames' tow and the Nos. 1 and 4 in the Fisher's tow. The steel tug S. M. Fischer of the line is in command of Captain Thos. P. Dun. The carferry barge No. 1 is in charge of Captain James Cavaugh, and the No. 4 is in command of Captain Robert Emerson, of the No. 2.

#### CHICAGO RIVER IMPROVEMENTS.

At a meeting of the executive committee of the Chicago River Improvement Association held on Friday, a resolution was framed for presentation to the State Legislature giving the consent of the state to the purchase and condemnation of lands along the rivers in that part of the United States in connection with the widening of the river. Following is the resolution:

"Be it resolved, by the Senate and House of Representatives of the State of Illinois, That the assent of the General Assembly of the State of Illinois be and the same is hereby given to the United States to acquire title to, by purchase or condemnation proceedings, in accordance with the laws of the United States and this State, and to hold and possess all lands necessary for widening the Chicago River and its branches, as provided for by act of Congress entitled 'An act making appropriations for the construction, repair and preservation of certain public works on rivers and harbors and for other purposes,' which became a law on June 3, 1896; and the State of Illinois hereby cedes to the United States jurisdiction over any or all lands so acquired."

A committee consisting of John C. Spry, George E. Adams and Francis Beidler, was appointed to see that the resolution is properly introduced.



### APPRENTICE SYSTEM.

Now that our inland marine is assuming gigantic proportions, under the able management of a qualified and experienced class of men, we think the time has arrived when a regularly organized system of apprentices would tend to increase the efficiency and elevate the standing of the future service. It may in a manner be generally understood that the craft or skill of seamanship does not require a thorough and special training; but the contrary is the fact, and the youth enjoying these advantages would be more competent at the expiration of a few years than one who was allowed to gather his knowledge variously, and from perhaps questionable authority, thus requiring fully double the service to assure himself from practical experience that the theory, as laid down by the past experience of others, was correct. A respectable, intelligent youth, joining a vessel with the understanding that he had embraced sailing as a distinct profession, would, no doubt, yearn to become a proficient in the work and craft of seamanship, and it would be the duty of his employers to see that the lad had opportunities given him to learn how to control a vessel. Under the head of causes of collision alone may be mentioned the seemingly permanent neglect or misapprehension of the steering and sailing rules, bad lookout, foggy or thick weather, error of judgment, neglecting to show lights, parting cables, dragging anchors, want of seamanship, anchoring in foul berth, and various other causes which the apprentice would require to be taught for the preservation of his employer's property. The youth so appointed by any of our large ship-owning firms would enjoy singularly fortunate advantages; for while the season of navigation, including the fitting out and laying up of their vessels, would probably occupy eight months of the twelve, the other four months could be profitably spent in acquiring a theoretical knowledge of their business by attending a progressive series of studies at a navigation academy, where they might learn chart exercises, the use and adjustments of the sextant, and other measures, work amplitudes, and azimuths, compute the variation and be conversant with the laws of deviation, the theory of the law of storms, nautical astronomy, and other kindred subjects, besides learning what probably would be considered more practical, a knowledge of masting, erecting shears, to cut and fit rigging, draft and cut sails, to moor and unmoor, and to keep a clear anchor by the methods in use for tending ship at single anchor, and to understand the nature of invoices, charter party, bottomry, and the various points that constitute a maritime lien. Then the apprentice would be a valuable servant to the shipowner, besides having fulfilled the ordinary duties of one of the crew during that period. In this way apprentices might serve their time, become officers, and take command under the same firm, their length of service assuring the owner of their capabilities and desire to earn a reputation in the employ they were trained in. "General education," said a distinguished professor, "should aim at causing a man to form an intelligent opinion with regard to the ordinary affairs of life, and be full of resources for meeting new emergencies."

Technical education should aim at enabling him to understand the process and the machinery of the special work in which he is engaged. Indeed, a thorough education, together with a special training for some particular employment, is becoming more necessary every year, and this we hold is equally true afloat as well as ashore. The rapid and increasing growth of steam navigation calls for an entirely different class of men to what were employed on the sailing craft only a few years ago, and to meet this requirement a class of intelligent young men, who had served several seasons in the steamers, would naturally be, if not the most competent, at least excellent material to qualify under proper instruction and guidance for the more responsible position on board a vessel; and while competency in their profession cannot be attained except through the first few years of comparative drudgery and hardship, yet this trying period would be made lighter and less irksome when the apprentices had the knowledge that in a few years they might, by a strict attention to their owners' interests and their own skill and good conduct, be qualified to command a steamer themselves.

On looking back, we find that the boys on the small coasting vessels made the masters of the East India and China clippers afterwards. So also in the English mer-

cantile marine we may find the youth, who was an apprentice but a few years ago, now in command of a fine vessel, and frequently in the same line or employ as that in which he served his time, and as a proof of the excellent features of marine apprenticeship, we may say that almost every large modern ship under the English flag carries three or four intelligent young men who have taken hold of the profession with the intention of learning it thoroughly, and becoming in due time master mariners; being perfectly aware, however, that their own experience alone is not going to place them in this position, they consequently study up the teachings of those who have gone over the same ground before, attend when on shore at a navigation academy, and practising what they may have learned there when at sea, with the addition of the advice and writings of the most skilled and eminent men in the profession, they soon become fitted to fill a position of trust. It has been said that "you can make a soldier at short notice out of any healthy man, but it takes time to make a sailor," and we might add inclination and talent, accompanied with sobriety and good conduct, are essentials if superiority is desired.

In the first annual report of the Commissioner of Navigation, in 1884, we find that a system of apprenticeship is recommended to be established in pursuance of which American merchant vessels engaged in the foreign trade might receive a certain fixed sum from the government for the support and instruction of apprentices carried on board for a stated term of years. Such a system would, it is thought, do much to improve the average standard of American seamen and repay the national expense in affording an available corps of seafaring men who could be relied upon in case of emergency to help man the navy. Yet, notwithstanding the most favorable reports from the shipping commissioners at the various large coast ports and the strong recommendations from our foreign consuls, no farther steps have been taken in this important matter, and it would seem as if private enterprise would be obliged to take the initiative in organizing the system of marine apprenticeship, which, if once established, would soon become a popular mode among those desiring to obtain a command; hence, we would earnestly urge the owners of the large established steamboat lines to secure the proper mettle and bring up their own officers and masters, resting assured that as the sailor is always loyal to his flag, so also would these lads be found zealous and trusty servants to the ship, to the master, and to the owners they sailed under.

### SUMNER'S METHOD OF FINDING A POSITION.

This valuable theory emanated from the direct researches of an eminent American seaman named Sumner, and has been almost universally adopted by marine observers to discover their position when from any unusual cause the regular observations have not been taken. The position of a vessel being accurately determined at noon by using the sun's meridian altitude, it follows that if the sky happens to be cloudy, or there is a light fog at this particular hour in the day, the mariner's calculations will be accordingly delayed until some other rule and method is called upon to furnish the required knowledge. Ordinary navigators measure the sun's hour angle a few hours before noon, noting the time by chronometer, and having an observation reduced to the observer's meridian. The formula for finding a position is simple and well defined; such is also the case when the hour angle is determined a few hours after noon, but both of these observations depend on the true altitude of the sun being found at noon, or when the sun arrives at its meridian altitude; hence, in former times the A. M., or P. M. sights were of no consequence, unless the correct latitude could be determined on. This important part of the navigator's work has been rendered free to the marine world by the thought and attention expended on the subject by Captain Sumner. The result is based upon the facts that the sun is in the zenith of some one place on the earth's surface at every moment of time, and consequently the sun whenever observed cuts or divides a great circle, one-half of which will have the sun above the horizon and the other half below, and any small circles drawn parallel on the enlightened half will mark those places in which the sun has an equal altitude, and a line of position being found the vessel must be on that line. Should the line of bearing reach the land its direction gives the course by

which the land can be made if desirable, otherwise a sounding taken proves the line of bearing to be correct.

In case the mariner wishes to make a certain part of the coast, it is only necessary to draw a line parallel to the line of bearing and steer for this line, then shape the course according to the direction of the line bearing, sounding regularly to check his position. In the event of having a clear night Sumner's method may be worked to advantage by observing two or more of the principal fixed stars, and lines of position drawn on a chart will give a near position of the vessel.

The problem always gives a correct latitude as the lines of position move parallel to themselves. It is also complete in itself as it not only gives the latitude and longitude, but also the true bearing of the body observed and thence the compass error, if any.

From this it follows that if an altitude be worked out with the latitude by account and the point thus determined be marked on the chart, a line through this point drawn in a direction eight points from the sun's bearing will be a line of position.

The clear atmosphere and the good horizon usually found on the water ought to be a great incentive to our lake mariners in searching out and studying the many natural phenomena to be observed, and we look forward to the time when we may be in a position to chronicle the celestial discoveries made by native talent on these waters.

### THE QUARTER'S SHIPBUILDING.

From the returns compiled by Lloyd's Register of Shipping it appears that exclusive of warships there were 428 vessels of 828,481 tons gross register under construction in the United Kingdom at the close of the quarter ended March 31, 1897. The particulars of the vessels in question show that the present returns exceed those for the last quarter by 44,000 tons, and are the highest which have been received since March, 1892. Of the vessels under construction in the United Kingdom at the end of March, 349 of 623,671 tons were under the supervision of the surveyors of Lloyd's Register. In addition, 31 vessels of 82,175 tons are building abroad. The total building at the present time under the supervision of Lloyd's Register is, thus, 380 vessels of 705,846 tons. Details of this total follows:

	No.	Gross Tonnage.
Building in United Kingdom for home account, for sale, etc.....	300	514,389
Building in United Kingdom for foreign and colonial account .....	49	108,682
Building abroad for foreign and colonial account, and for sale.....	31	82,175

Total building on 31st March for classification in Lloyd's Register Book..... 380 705,846  
The work in hand at the principal centers is distributed as follows:

DISTRICT.	31st March, 1897.		31st March, 1896.	
	Ves-sels.	Gross Tonnage	Ves-sels.	Gross Tonnage
Belfast.....	24	147,242	20	107,247
Barrow, Maryport, and Workington..	10	11,035	7	11,330
Glasgow.....	87	160,969	91	167,146
Greenock.....	38	85,560	41	77,245
Hartlepool and Whitby.....	17	47,420	17	46,516
Middlesbro' and Stockton.....	27	67,514	26	49,300
Newcastle.....	68	129,731	50	136,130
Sunderland.....	44	134,321	48	137,116

One of the triumphs of modern engineering is the canal being built for the purpose of carrying the vast amount of sewage of Chicago into the Mississippi river, the main design being that the waters of Lake Michigan shall flow through it at the rate of 10,000 cubic feet per second, the intention being to have the sewer so diluted that no possible harm can occur to the towns by which it shall flow. Among the most striking data of this immense work is that of its length, viz., twenty-eight miles. Where it passes through alluvial ground the width at the bottom is 202 feet; but the material taken out is of a widely varying character, ranging from a soft mud, so soft that it can be removed by pumps, to a mixture of sand, gravel, clay and boulders, which is cemented so firmly as in some cases to require blasting. But much of the excavation is through solid rock. The estimated quantities to be removed are 4,500,000 cubic yards of wet soil, 23,000,000 cubic yards of alluvial and hard soil and 12,000,000 cubic yards of solid rock—nearly 40,000,000 cubic yards of excavation.



## LAKES.

Before the Wagner Institute of Philadelphia W. B. Scott, professor of geology at Princeton University, recently lectured about the formation and life of lakes, from which the following interesting extracts are taken:

"Lake" is a very comprehensive term, covering waters gathered and held from different sources. The smaller bodies of water may be held securely above the general drainage level of the country; large bodies never are.

Lakes are transitory and ephemeral—though not so in comparison with the events of human history. No one connected with the commerce of the great lakes need worry over the fact that they will some day disappear; such, however, must be their fate, ultimately. As mountains are short lived compared with plains, so lakes are short lived compared with rivers.

A very ancient topography is invariably marked by the absence of lakes. A lake map of the United States shows the northern states crowded with them, Wisconsin and Minnesota having them by hundreds. There are more lakes in Massachusetts than in the whole south, a difference due to our northern topography being all young. Every bit of it has been remodeled by the great ice sheet lately covering it, while this ice sheet did not extend into the southern states. Consequently the southern topography is old, and with comparatively few exceptions, what lakes they had have disappeared.

In most mountainous regions lakes abound; yet in an old range like the Apalachian they are wanting. They occur in the Rocky Mountains, the Sierras, the Alps, the Himalayas—but these ranges are all of much later date.

There are many methods of lake formation. There is the lake of a land surface recently upheaved, as in Florida, which, geographically, is young. Such lakes are comparatively rare—there being few surfaces which are youthful to this extent.

Others arise from atmospheric weathering. Rock destruction by aerial agents never take place uniformly; but always more rapidly along certain lines than others, so when any denuding agent comes along and sweeps clean the rock surface of detritus, a very irregular surface will be left, and a lake basin is formed.

Many lakes are merely extended river basins flooded. Usually some sort of a dam is thrown up at a point in the stream which will produce a lake. Sometimes this dam is the delta of a side stream, the tributary bringing in a good deal more debris than the main stream can carry off. Lake St. Peter, not far below St. Paul, is merely an expansion of the Mississippi river, three miles wide and five miles long. The lake was formed by the Chippewa river, which comes from the east and throws out a delta into the stream, which acts as a dam at a point where the valley is narrow. This dam shuts up the valley and the stream widens out into a great lake. When the Chippewa has cut down to the base level the Mississippi will be able to take away all that the Chippewa brings and to dig away part of what the Chippewa brought before. The Mississippi will eventually cut through that barrier and the lake will be drained away just exactly as you drain a pond.

Glacial erosion is one of the most important methods of lake formation, and glacial deposition makes lakes on a smaller scale. A valley, having moraine material deposited at its lower end, will, when the ice sheet has disappeared, become the site of a lake if a stream flows there.

With a glacier flowing past the end of a valley, the lateral moraines piled up will likewise form dams and thus lakes.

Periodical lakes are found through the Alps and in all other glacial regions, where the great body of ice acts as a dam. They melt a tunnel for themselves through the ice, and away under it, and often empty out with disastrous results.

Volcanic action makes what are called crater lakes, occupying the crater of an extinct volcano. One of the most remarkable of these is in the Cascade Mountains, called Crater lake, and six miles in diameter.

Another way in which volcanic agencies may produce lakes is by a lava stream damming up the mouth of a valley, as was done by ice in glacial days. Lakes of this kind abound in eastern Oregon, and the adjoining parts of Washington, Idaho, California and Nevada, where the whole country has been overwhelmed in great floods.

Earthquakes produce lakes in two ways—one being that the lava, flowing in a deep, narrow valley, is dammed by

having a fold of the earth thrust up across the mouth of the valley, a fold of a few feet being enough to produce a very effective dam, and thus convert a stream into a lake. A number of lakes of this character were formed by the Japanese earthquake of 1890. The earthquake may also do the same thing indirectly, by the landwaves or landslides. The great landslide of 1880 at Elm, Switzerland, displaced 12,000,000 cubic meters of rock to an average distance of 2,000 feet. In mountainous regions a great many of the valleys are occupied by narrow streams, emptying through deep gorges. A landslide, by tumbling a huge mass of rubbish down the mouth of this gorge, would thus back the water up, producing a lake where there had formerly been a stream.

The great Laurentian lakes (through the St. Lawrence to the Atlantic), the great lakes of Africa, the salt lakes of the interior of Asia (like the Black and Caspian Sea) are produced by the movements of the earth's crust itself. An unequal movement of this crust will produce depressions, which, becoming filled with water, give rise to these vast lakes.

The smaller lakes are those which are connected with glacial agency, one way or another. You can draw a line of the terminal moraine, showing the extension of the old ice sheet, and see a difference between the number of lakes in the region lying north of the terminal moraine and that lying at the south, which was not glaciated. In the other case there are lakes by the thousands; in the other none at all. In the whole south of the United States there are practically no lakes—one or two at New Orleans, like Lake Pontchartrain. There are more in a single county of Minnesota than in all the southern states. This is due to the fact that the glacier has rejuvenated the northern topography.

The old topography is pre-eminently without lakes, which have disappeared by the cutting down of the barriers or by the filling up of their basins. Small lakes are removed in either way. A little bit of a lake, a few feet across in extent, is frequently choked up by vegetable matter and thus converted from a lake into a peat bog, then into a swamp, and finally into a meadow. Somewhat larger lakes are filled by the deltas of the streams that flow into them.

Great lakes are removed by the cutting of their barriers, which requires a very long period of time, because the streams flowing out of lakes are remarkably clear. Lakes act as settling basins, and clear, pure water has very little power in the way of cutting out rock. Further, these lakes generated by movements of the earth's crust are very apt to be below sea level. The bottom of Lake Superior is several hundred feet below sea level, and no stream flowing out of Lake Superior is going to be able to saw its barrier below the bottom of the lake, because it is already below base level. So Lake Superior is going to be a very long-lived lake. In the course of the centuries the barrier will be cut down to base level and the lake very greatly reduced in size. Eventually it will be filled up with material washed in from the banks and brought in by the tributary streams. That will be the end of Lake Superior.

Salt lakes invariably imply an arid or dry climate. If you could bring the Great Salt Lake of Utah and set it down in eastern Pennsylvania, you couldn't keep it any length of time. The basin in which you put it would gradually fill until it would rise to the level of some point in its banks, when, securing an outlet, it would freshen at once.

Salt lakes are of two origins—those which are merely cut-off arms of the sea and which were salt from the beginning, and those which are due to the indefinite concentration of river water by means of evaporation. River water contains a good many things in solution—carbonate of lime, sulphate of lime (gypsum), chloride of sodium (common salt), smaller quantities of chloride of magnesium, chloride of calcium, etc. Provided you keep on boiling these things down long enough, you would invariably get a salt lake. The water being distilled off all the time by the action of the sun, no matter how dilute the solution with which you begin, you must eventually end up with a saturated one. Great Salt Lake and the Dead Sea are so saturated with brine that they are depositing salt all the time.

In Great Salt Lake the water is so dense that swimming in it is one of the most remarkable experiences imaginable. You can stand up straight with your shoulders upward and you are out of water. While it is impossible to

drown there in the ordinary sense, it is very easy to get into trouble in it, because the water is so intensely bitter, and if you get any of it in your eyes or throat, it is like a dose of liquid fire. Novices who don't know how to swim turn the wrong way up. The head goes down and the feet goes up; and they suffocate and drown in that frightful stuff simply because they can't keep the head up. To a person who can swim it is a sensation of being absolutely without weight. It would be like flying, if one could move fast enough. The sensation is all due to the excessive density of the water.

Lake Agassiz is a very large body of water in Manitoba, adjoining parts of North Dakota and Minnesota. It had a north and south diameter of some 700 miles—very much larger than any one of the five great lakes of the present time. Lake Agassiz was formed in this way: The great ice sheet which came down from the north was a series of great glaciers. For these there were three principal areas of distribution. The first was in Labrador, the second in the highlands west of the St. Lawrence river and south of Hudson Bay, the third the mountain ranges of British Columbia. These three great floes of ice reached their maximum extent at different times. The Kiwatt glacier swept down over Manitoba into the upper Mississippi valley, into Minnesota, and probably down as far as Iowa; then it commenced to retreat; and when it was retreating, the great Laurentian glacier from Labrador was coming in from the east. There came a time when the Riwatti glacier formed a northern dam and the Laurentian glacier an eastern dam, and two standing nearly at right angles; and in this great dammed up space was formed Lake Agassiz. It rose until it could overflow the barrier to the south, and thus discharge into the Mississippi river by means of a river which now has entirely disappeared, and was known as the River Warren, after the late Gen. George K. Warren, who first discovered it. This lake continued until the glaciers up there, retreating one to the northward and the other to the eastward, separated and left a space between them. Then the drainage way to Hudson bay was opened again, and the lake was very rapidly drawn in that direction. We can find perfectly well the old beach line and the old drainage of Lake Agassiz has completed. The old terraces, and beaches are there today, and the level bottom of the lake is clearly shown. The whole history of the lake has been made out with perfect clearness and definiteness.

Lake Bonneville occupied nearly all of eastern Utah in the pleiocene period. This lake had about four periods in its history. In the first period of rainfall the lake gradually acquired an area of 19,000 square miles—filling the whole of the depression of eastern Utah with water to the maximum depth of 1,000 feet, until an outlet was found in the north in the Snake river valley, and through the Snake into the Columbia, and thus to the Pacific. Then the climate of the country changed and evaporation exceeded rainfall, and the lake steadily shrunk until it became dry. That was the second period. The third was where the rainfall again increased until the lake assumed its old extent, and even exceeded it, and then had its outlet again in the north. After this came another period of minimum rainfall, when the lake again dried up, and Salt Lake is one of the remnants of old Lake Bonneville, but only one-twentieth its size. At the left hand side of the Wahsatch Mountains the lines of the old lake shore can be seen for many, many miles.

The Yellowstone lake is a rock basin. Not very long ago, from a geological point of view, it had a drainage the other way. The old outlet led southward across to Ocean Pass, down through a comparatively insignificant river into the Pacific. Its traces are still clearly visible, whereas the present outlet is north by way of Yellowstone river into the Missouri, and thus into the Atlantic watershed. This is due to a change in the movement of the earth's crust, but the basin itself is partly due to atmospheric disintegration.

A waterway to connect Red river with Rainy lake is proposed by building a dam at the outlet of Red lake, thus creating a water line of transportation extending from Thief River Falls to the head of Red lake, a distance of 84.6 miles on the river and 50 miles on the lake. From the east end of Red lake a canal can be very cheaply cut through to Rainy river—a marsh covers the whole distance—thus, it is said, opening a great stretch of country bordering a navigable river, including the Lake of the Woods.





ESTABLISHED 1878.

Published Every Thursday by

THE MARINE RECORD PUBLISHING CO.,

Incorporated.

GEO. L. SMITH, President.

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One Copy, one year, postage paid,	-	-	\$2.00.
One Copy, one year, to foreign countries.	-	-	\$3.00.

Invariably in advance.

## ADVERTISING.

Rates given on application.

All communications should be addressed to the Cleveland office.

THE MARINE RECORD PUBLISHING CO.,

Western Reserve Building, Cleveland, Ohio.

Entered at Cleveland Postoffice as second-class mail matter.

CLEVELAND, O., APRIL 22, 1897.

The gale of Monday caused considerable trouble and damage to the early fleet navigating the lakes.

It is about time that we got away from calling cargo, freight. Let us once more impress upon our readers that freight is the money earned for carrying cargo. Railroad parlance ought no longer to be continued in connection with marine or lake affairs. Cargo is cargo, either bulk or general, freight is the recompense for carrying same.

Our thanks are due the Chicago Ship Building Co. for a courteous invitation to attend the launch of the Minneapolis and St. Paul on Saturday next, April 24th. These steamers are built to the order of the Lower Lake Steamship Co., Cleveland, and are of the Welland Canal size, being specially built and adapted for that trade. The time set for the launches is 2:30 and 3:30 p. m., respectively.

When groundings take place The Record is generally notified, should any master, mate or pilot on the lakes thump anything unexpectedly this season, we will be pleased to bring it to the attention of the proper authorities, but in doing so, we would ask for bearings and distances to be furnished, furthermore, please state whether the bearings are compass, magnetic or true, distances, nautical, or statute, and if convenient, always secure cross-bearings.

The Canadian commissioners, under the Deep Waterways Commission, have completed their report to the Dominion government of their joint deliberations with the United States representatives. Much information has been gained and plans formulated, with accompanying sketches and maps. The United States government will be asked, however, to appropriate \$150,000 for further surveys and deliberations. The Canadian commissioners, O. A. Howland, C. T. Keefer and Thomas Munro, will ask for about \$15,000 to make surveys.

There is some talk and a little apprehension on the part of some vessel owners about the proposed Canadian law which will provide that all American vessels entering the Welland Canal shall be manned by Canadians while making the passage. This, of course, is a measure of retaliation against the Alien Contract Labor law. If the measure becomes a law it will affect only the small number of vessel owners who do business in Canadian waters. The Welland Canal is again open for the usual season trade, Tuesday morning being the first lockages.

## MERCHANT MARINE.

The question of wages paid men serving in the merchant service is frequently put forward as one reason for the decline and stagnation of the American merchant marine. Another subject often discussed at great length is the dietary system, which is always spoken of as being much more liberal and consequently more expensive than the scale set forth and signed by the seamen of other nationalities. According to the above remarks the daily expenditure being greater, our vessels required a better rate of freight than those of foreigners, simply to meet the wages and ship chandlers' accounts, and it was thought advisable sometimes, in the past, even to send a ship to sea with fewer men, depending on quality to make up for numbers, so that the American ship could compete successfully in the freight markets of the world. However, we may venture to say that the average small increase in wages has little or nothing to do with the decline of American foreign shipping, and we draw this inference chiefly from the fact that the nation predominant in marine affairs today pays more wages than any of her competitors in the traffic of the seas. If the American seamen's wages exceed those of Great Britain, so also does the wages of the latter power exceed the average of all other nations, and as they have the ships to sail, Danes, Americans, Germans, Swedes and Norwegians, are found sailing them, and in point of fact a foreign crew is always given the preference in an English ship so that although the nation has attained the point of superiority in her merchant marine it has not been arrived at by purely native talent and energy. The food served on the English vessels is also better and more plentiful than that supplied by any other nation, excepting our own, and with the same result, viz., progression as said above in all the maritime branches of commerce and colonization, hence it may be shown that the small increase of expense as represented by the extra pay and diet is no factor in the prosperity or decline of a merchant marine, so that the apparently insurmountable obstacles which this country's mercantile service would have to face would dwindle into insignificance. Notwithstanding the croaking of the individuals who show at a glance that American shipping cannot prosper when handicapped as it is both on wages and food bills.

If we had the ships Lascars might handle them, even if it took double the number, but without vessels for our foreign trade we are compelled to foster and encourage alien interests, knowing at the same time that the field is open for all and that this country is as bountifully supplied with the necessary material as any other. Quoting from a report of the commissioner of navigation this authority says that we have "foreign skill, experience, and a long established business to contend with," but we should make the attempt to compete with them or the next twenty-five years may see us without any ships except our fleet of lake craft and coasters.

The importance of a great commercial navy to a country that possesses it has recently been the subject of much investigation and study, and our ablest economists and statesmen on both sides of the question agree that a large and important merchant marine should be an established quantity in the elements of a flourishing nation, and having these facts acknowledged, congress still seems to hesitate in legislating for the encouragement of shipbuilding, being as it were humbugged by the inconsistent belief that we dare not compete because it apparently takes more money to sail an American vessel than any other.

When this country had a merchant fleet the build and discipline maintained were noted as the best on the seas, and the sons of our best citizens embraced the profession eagerly, then, when they were put into competition with the rest of the world a spirit of emulation was aroused, which aided in creating seamen unsurpassed by any nation. With the decline of our shipping the maritime spirit of the rising generations checked, and now we are in an unenviable position, without ships or Americans to man them. As our commercial interests increase we will feel more keenly the effects of this deplorable condition, our future prospects, we cannot hide the fact that unless something is done at an early date the evergrowing trade of the world will pass entirely out of our hands, and the distinctively American merchant seamen will be a personality of the past.

## NAMING VESSELS.

While there are so many new vessels now in course of construction at the various ports on the chain of lakes, we consider it to be our duty to point out the irregularities and complications liable to rise through a repetition or similarity of names. Already there are several names of vessels duplicated, much to the chagrin and dissatisfaction of people who are not directly interested in the ownership, but who from a relative or business sympathy frequently desire to learn the whereabouts of the craft—and not being acquainted with the special trade that the boats are in are surprised to hear through the papers of her being in Chicago River when as a case in point might go to prove she was elsewhere.

As shipping property increases in numbers, complications will also occur in reporting by telegraph and otherwise, and a portion of correctness will have to be left to the intelligence of people interested. We consider it strongly advisable for owners and builders to avoid even a repetition of the initial letters as that part of a vessel's name is frequently learned when the full word cannot be ascertained, if this fact was kept in view, much anxiety might be spared the owners, the relatives of the crew, underwriters and others who are always watching the career, and welfare of the vessel. Although very little importance is attached to the naming of a new vessel, and she may be allowed to travel under anything but a clear sounding or appropriate name, yet if due weight was given to the possibilities of importance involved in the name she bears, we are convinced that more attention would be paid to the question, and compound, and unpronounceable names, with a superfluity of initials, would be left severely alone. In this connection we do not wish to be thought hypercritical, yet we can hardly recognize even the ancient biblical name of Castor and Pollux, as being a good one in the sense of individuality, and clear sounding, as required at the present day. However, be this as it may, we believe that owners would follow their own interests by giving clear and simple names to their vessels, at the same time allowing the Commissioner of Navigation at Washington, a wide discretionary power in accepting or rejecting any names which may be considered objectionable from any of the above causes, thereby exercising an official supervision for the benefit of all concerned, and as the registration papers have to pass through the office of the Bureau of Navigation before the official number can be assigned no inconvenience or friction would be liable to occur in suggesting any alteration in a name as desired by the owner who has not the facilities for determining whether the name as offered is borne by, or been assigned, to one or more vessels, either on fresh or salt water as the case may be. Not only need the nomenclature of vessels be watched from our own ports, but the commissioner should see that there is a material difference in the hull, rig and tonnage of vessels under the same or a similar name hailing from the Canadian ports and trading in the same waters as our own boats, acquainting the owners of the fact if such be the case. Up to the present time, however, we believe that a strict attention has been paid to these requirements at the Bureau of Navigation, yet we desire to call attention to the points enumerated in this article as the name of the vessel is the general and public mode of designation as opposed to the more correct, yet usually unknown official number, and although the system of naming vessels need not necessarily be treated in an international sense, we would on general principles, advocate an attention from and to the names issued by other nationalities, so that when our merchant marine becomes as flourishing on the ocean as it once was, no difficulty will be found in exchanging signals, or reporting vessels whether the ensign is shown or not. On the other hand, in the absence of the code flags, which are not required on the lakes, or the Semaphore system of signalling more attention will perhaps have to be paid to the naming of a vessel on fresh water, than is required on the coast.

## AN ERRAND OF MERCY.

The whaleback City of Everett is to be used by the United States government to carry a cargo of grain to the famine sufferers of India. The steamer will load at San Francisco and will soon be dispatched on her errand of mercy. The railroads have transported the grain free of charge to the California metropolis and the dock workers at that city will also load it aboard the steamer without cost.



**GRAIN SHOVELING CHARGES REDUCED.**

The following report has been submitted to President Millen of the Lake Carriers' Association by a special committee composed of Capt. J. J. H. Brown, P. P. Miller and John Kelderhouse:

Dear Sir—The undersigned committee appointed by you at the last annual meeting of the Lake Carriers' Association to endeavor to secure a reduction in the grain shoveling charges at this port, beg to report as follows:

The said committee have this day made an agreement by which the shoveling charges are reduced from \$3.50 per thousand bushels to \$3.35, the reduction to take effect today, and to continue in effect all of this year.

Your committee would have been pleased to have had the power to report a greater reduction in the charge, but the reduction effected is the result of a great deal of patient application to the business in hand, and when you consider that any reduction effected in these charges is at the expense of some other interest, we trust you, and vessel owners generally, will be satisfied with what has been accomplished.

On the basis of last season's total receipts of grain, including flaxseed, at this port at all elevators, in and out of the association amounting to about 173,000,000 bushels, the saving in this instance to the vessel interests would amount to \$25,950. By the arrangement effected by the Lake Carriers' Committee two years ago, a saving of fifty cents per thousand was effected, which would amount to \$86,500. Three years ago another committee secured a reduction of twenty-five cents per thousand in shoveling charges, which, on the basis of last season's receipts,

has to be filled at full figures. Some unsatisfied demand for prompt tonnage for the berth of China and Japan is still on the market, but charterers appear unwilling yet to meet owner's demands.

**NEW TONNAGE.**

Official numbers were assigned by the Bureau of Navigation this week to the Constitution, 3,231 tons, built at Superior, Wis., and owned at Cleveland. The Andrew Carnegie, 4,107 tons, built at Cleveland, and the Venezuela, 2,125 tons, built at West Bay City, and hailing from Port Huron.

**LIFE SAVING SERVICE.**

Life saving service promotions recently made are those of Surfman Gibb, of Marquette station, to be keeper of Crisp's station, on Lake Superior, and of Surfman Daniel Gnesser, of Point Marblehead, to be keeper of the same, to succeed Keeper Clemens, resigned.

**A NEW STEAMER LINE.**

The first steamer of the new Baltimore & Ohio lake line between Milwaukee and Chicago and Fairport is scheduled to start from Milwaukee. It is expected that she will leave there on April 20. After that date two steamers will leave that port every week over the new line.

**OPENING OF NAVIGATION.**

A Canadian exchange says that the average date of the opening of navigation for the past twenty years is: Port Arthur, April 26; Sault Ste. Marie, April 27; Sarnia, April

**A DOUBLE LAUNCH.**

A double launch will take place at the yards of the Chicago Shipbuilding Company on the Calumet, Saturday, April 24. The two boats are the twin steamers Minneapolis and St. Paul, named after the twin cities of the northwest. The Minneapolis will be the first to go into the water, her launch taking place at 2:30 o'clock in the afternoon, and the St. Paul will follow an hour later. They do not belong to the largest class of freight steamers on the lakes, but are built to be able to pass through the Welland canal into Lake Ontario. They are just the size of the locks. They are owned by R. R. Rhodes, a Cleveland vesselman, and will enter the service of the Soo line, running between Gladstone and Buffalo in the flour and general merchandise trade.

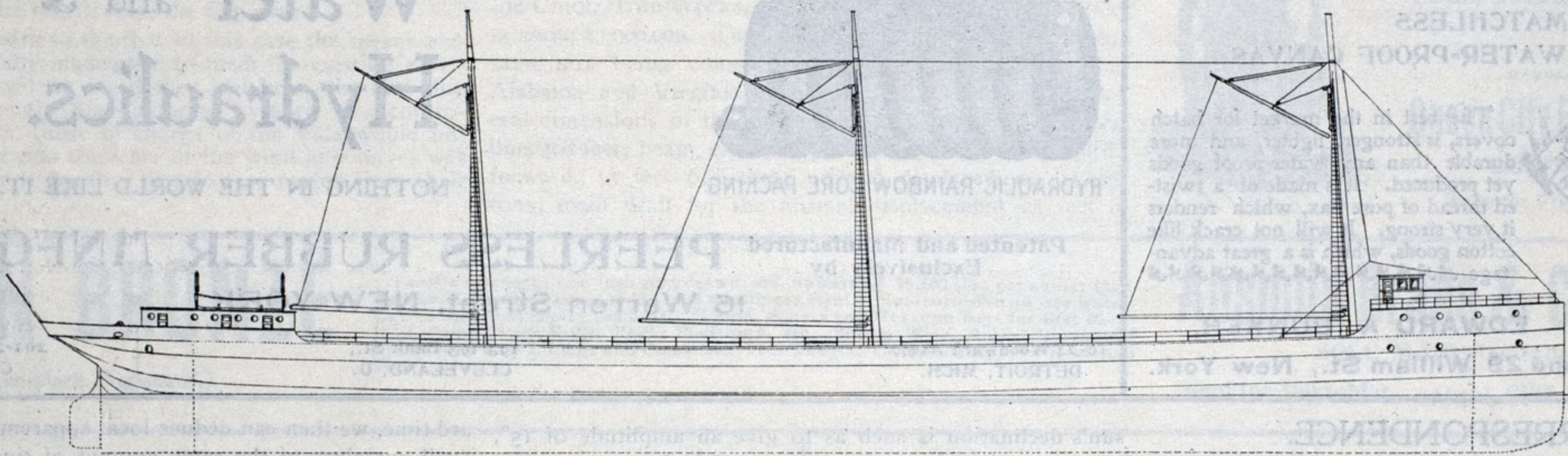
**NOTICE TO MARINERS.**

Treasury Department,  
Office of the Lighthouse Board,  
Washington, D. C., April 17, 1897.  
DETROIT RIVER.

Ballard Reef Channel Gas Buoys.

Notice is hereby given that, on April 8, 1897, gas buoys, as follows, were established on the westerly side of the Ballard Reef Channel, Detroit River, in lieu of the float lights heretofore maintained by the Lake Carriers' Association. The buoys are on a line parallel with and about 350 feet to westward of the Grosse Isle south channel range line.

South Gas Buoy, No. 1.—A black, third-class buoy, showing a fixed white light, in 22 feet of water, about 5,000 feet (15-16 mile) N. by W. ½ W. from Limekiln Crossing light vessel (North), No. 65. Head of Bois Blanc Island range front (Canadian) lighthouse, S. 3-10

**THE STEEL BARGE ANTRIM.**

Building by the Globe Iron Works Co., Cleveland, to the order of George Tenor, Pittsburgh. Her dimensions are 378 feet over all, 366 feet keel, 44 feet beam, and 26 feet depth of hold. She will be launched in about two weeks.

would amount to \$43,275, or a total of \$156,725 saved per annum on the basis of last year's receipts at this port.

All of which has been accomplished by committees appointed by the Lake Carriers' Association from time to time and that without one dollar of expense to the association.

The gain does not end with the saving at the port of Buffalo, for heretofore the price at Erie and Fairport has been the same as the price at Buffalo, and it is to be expected they will be the same this year.

**EASTERN FREIGHT REPORT.**

Messrs. Funch, Edye & Co., of New York, report to the Record as follows: In view of approaching Easter, business of the week under review will be somewhat curtailed, but, apart from this consideration, our freight market is inactive, and transactions continue to show a steady shrinkage in volume. The most untoward feature is the absolute dearth of new business; all transactions, without hardly any exception, continue to cover old contracts.

Freights to Cork f. o. b., for prompt loading and for May have settled down to 2s 9d, and, whilst this figure has still been paid for some berth vessels, freights for May obtainable by larger vessels to direct port cannot be quoted over 2s 4½d@2s 6d. A feeble inquiry has still sprung up for cotton from Atlantic ports, resulting in a couple of fixtures; from present appearance it looks, however, as if pig iron might form, if not the main, certainly an important part of these cargoes. The demand for prompt boats for sugar cargoes up from the West Indies has not subsided, but vessels will have to be very close to loading port to command attention. Chartering for timber from the Gulf equally continues, and the inquiry

5; Port Colborne, April 25; Burlington Bay, April 11; Toronto, March 28; Kingston, April 5; Montreal, April 21. Earliest date—Port Arthur, March 18; Sault Ste. Marie, April 8; Sarnia, March 7; Port Colborne, April 15; Burlington Bay, March 1; Toronto, February 13; Kingston, March 6; Montreal, March 30. Latest date—Port Arthur, May 22; Sault Ste. Marie, May 12; Sarnia, May 3; Port Colborne, May 9; Burlington Bay, April 28; Toronto, April 25; Kingston, April 24; Montreal, May 5. The Record formerly printed a table of the opening and closing of navigation, but we have now given it up.

**A NEW LIGHTHOUSE.**

Congressman Southard, of Toledo, has received a letter from the lighthouse board to the effect that the board had decided to act upon the recommendation of the Lake Shipmasters' Association and would support the proposition to build a lighthouse at the outer end of the straight channel into the Toledo harbor. This is a victory for the shipmasters, as the board did not favor the proposition when it was advanced during the convention of the masters at Washington last winter.

**FREIGHT SITUATION.**

At Chicago this week grain rates to Buffalo dropped to 1½ cents on corn, but no vessels were even taken at this reduction. At Buffalo no coal is offering for shipment, and at Cleveland the coal freight market is in a slow state. Boats are plentiful and cargoes very scarce. The steamer John Eddy was chartered to load at Ashtabula for Sheboygan at 25 cents. No ore charters were reported worth considering, although single or trip charters were made from Escanaba to Lake Erie ports at 40 cents. From Marquette to Tonawanda 65 cents.

E.; west end of railroad bridge between Grosse Isle and Stony Island, SW. by W. ¾ W.; Grosse Isle north channel front lighthouse, N. by W. 15-16 W.

Middle Gas Buoy, No. 3.—A black, third-class gas buoy, showing a fixed white light, in 22 feet of water, about 1,200 feet N. by W. ½ W. from South Gas Buoy, No. 1. Head of Bois Blanc Island range front (Canadian) lighthouse, S. ¾ E.; west end of railroad bridge between Grosse Isle and Stony Island, SW. ¾ W., westerly; Grosse Isle North channel range front lighthouse, NNW.

North Gas Buoy, No. 5.—A black, third-class gas buoy, showing a fixed white light, in 22½ feet of water, about 1,200 feet N. by W. ½ W. from Middle Gas Buoy, No. 3. Head of Bois Blanc Island range front (Canadian) lighthouse, S. 7-16 E.; west end of railroad bridge between Grosse Isle and Stony Island, SW. ¾ S.; Grosse Isle north channel range front lighthouse, NNW., westerly.

Mariners are requested to exercise great care to keep clear of these buoys, as there is a natural set of the current to the westward in this part of the channel. Tows and rafts should be handled with especial care. These buoys are difficult to reset when once removed.

By order of the Lighthouse Board.

W. S. SCHLEY, Captain, U. S. Navy, Chairman.

The much-talked-of Bazin roller boat has proved a failure. She has had a trial on the Seine, and instead of steaming at the rate of sixty miles an hour, in accordance with the calculations of her inventor, she made barely twelve miles. Mr. Bazin made a mistake in underestimating the power that would be necessary in operating the huge disks or rollers upon which the ship proper rests. He expected that when the screw wheel which furnishes the initial power started the peculiar ship, the huge rollers would carry her along with express-train speed by revolving under the impulse of fifty horse-power applied to each axle. The power was increased, but this increased the weight also, and added to the immersion of the disks or rollers, and thus magnified the difficulties in proportion.



## H. C. BURRELL,

Marine Reporter.

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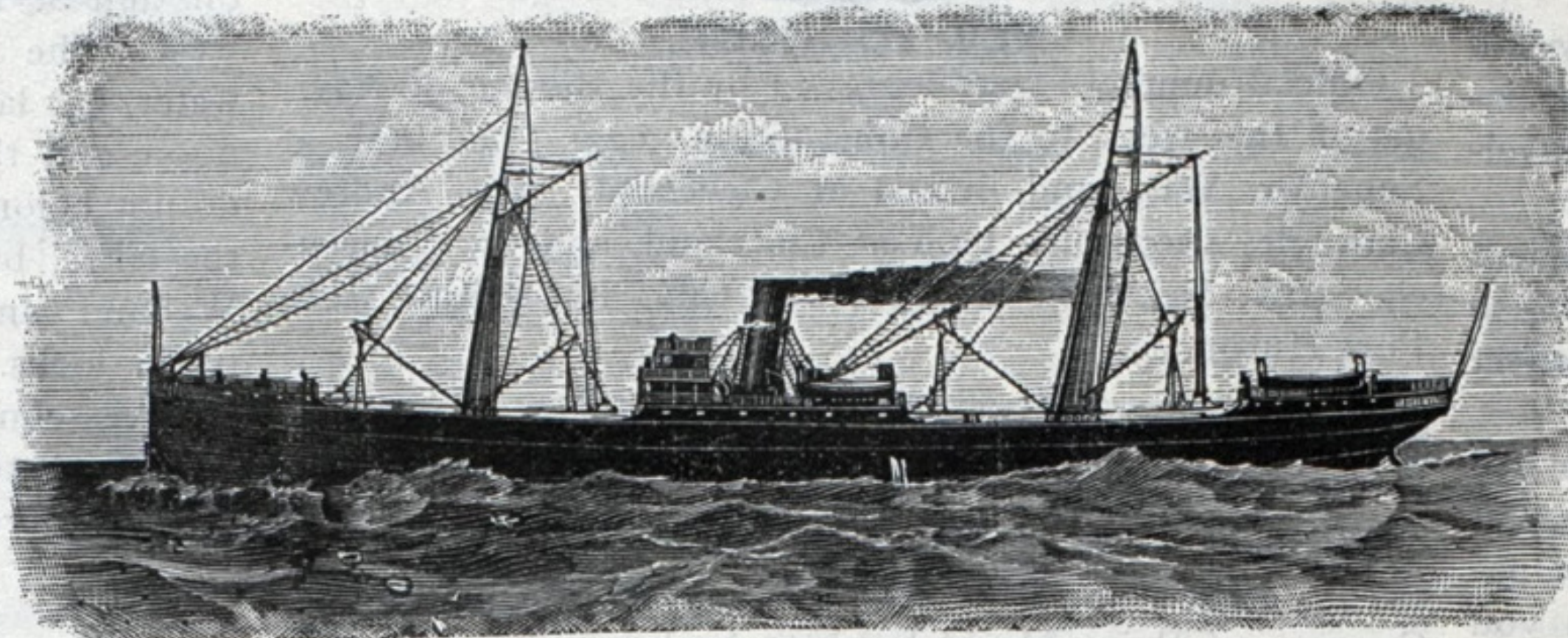
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202-210 S. Water St.,  
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## CORRESPONDENCE.

### AMPLITUDES AND AZIMUTHS.

Editor Marine Record:

There is a property in the change of the sun's direction or azimuth, morning and evening, during our season of navigation that is not generally known, but which is, nevertheless, of the first importance to our lake navigators, and that is—

When the sun is north of the equator, i. e., from March 20 to September 20, the change in his direction with regard to azimuth, from sunrise, up to, and about one-half hour after the time of his crossing the Prime Vertical, or due east point, is uniform, and may be taken, for the entire area of the lake region, at one degree in six minutes of time, thus making his direction known at any moment during the above mentioned time, provided we know his amplitude, i. e., his direction at sunrise.

Strictly this rate is about one-fourth of a minute slower in the southern part of the lake area, and about the same amount faster in the northern part; but this cannot result in any appreciable error with our compasses that are not graduated lower than single degrees.

This property of uniform change of azimuth on any parallel prevails north of parallel about 40° to the limits of navigation, the rate increasing slightly with the latitude, though, as above remarked, remaining constant for the same parallel, thus making this property available to the navigators of the Atlantic coast, where, with a standard time established and available in every port, apparent time is also available—whence Azimuth is there available within the limits of time above mentioned, with the same facility as on the lakes, thus bringing the navigation of our Atlantic coast within the easy reach of a class of men who cannot navigate the sea for want of technical training.

A little description will show the great advantage this property gives over a simple amplitude.

Suppose that on or about the middle of April, when the

sun's declination is such as to give an amplitude of 15°, how long will this amplitude be available?

Multiply the amplitude by the rate, we have:

$15^\circ \times 6' = 90' = 1\frac{1}{2}$  hours to the time when the sun is on the P. V., or due east, and we have half an hour after—that is we have two full hours instead of the proverbial 10 minutes immediately at sunrise, during which we know the direction of the sun at any minute, for we know that for every six minutes he goes to the right one degree, after which the rate begins to increase, till near noon it may be one degree in two minutes of time, or less.

Again: Suppose that some time near the middle of June, when the sun has an amplitude of say 23 degrees, then, as before, we have:

$23^\circ \times 6' = 138' = 2\text{h } 18\text{m}$ , making more than  $2\frac{1}{4}$  hours, during which the amplitude is available for direction, thus showing that for six months of the season of lake navigation we have an average of about  $2\frac{1}{2}$  hours on every morning of bright weather, during which time we may have the direction of the sun by simply observing the time, by watch, of sunrise, nor is it important that we know the error of our watch on local time, or any other time, but merely that it runs at the proper rate, thus bringing within the easy reach of any ambitious sixteen-year-old school lad the complete mastery of the one problem that suffices for the safe navigation of the lakes, the finding of compass errors, and what shipmaster will now show himself too tame to master this problem?

The equipments required to utilize an amplitude are a good watch, an almanac that gives the sun's amplitude and equation of time, and a dumb compass—all simple appliances, but, except the first, too little known on the lakes; and the outlook for a betterment in this condition of things is not good till we can get a new head in the supervising inspector general's office in Washington, D. C. In addition to noting the time by watch of sunrise, we are smart enough to know the error of our watch on stand-

ard time, we then can deduce local apparent time, and thus avail ourselves of the same amount of time in afternoon of each bright day, thus having about five hours a day from a single amplitude, for swinging ship for compass errors or for adjusting compasses, thus adding vastly to the facilities afforded by the ten or fifteen minutes at sunrise, and bringing into use the most simple and elementary method of finding direction. H. C. PEARSONS.

### VISIBLE SUPPLY OF GRAIN

As compiled for The Marine Record by George F. Stone, Secretary Chicago Board of Trade.

CITIES WHERE STORED.	WHEAT, Bushels.	CORN, Bushels.	OATS, Bushels.	RYE, Bushels.	BARLEY, Bushels.
Albany		30,000	20,000		
Baltimore	477,000	2,496,000	149,000	81,000	
Boston	215,000	839,000	178,000		
Buffalo	474,000	102,000	36,000	69,000	411,000
afloat		113,000	81,000		
Chicago	9,364,000	7,560,000	5,745,000	1,223,000	159,000
afloat	177,000	822,000	490,000	122,000	
Cincinnati			110,000	1,000	22,000
Detroit	261,000	79,000	9,000	36,000	9,000
afloat					
Duluth and Superior	7,205,000	52,000	2,125,000	899,000	1,332,000
afloat	1,019,000				
Indianapolis	92,000	58,000	1,000		
Kansas City	203,000	163,000	182,000	5,000	
Milwaukee	218,000	3,000	11,000	458,000	68,000
afloat					95,000
Minneapolis	13,738,000	92,000	752,000	37,000	97,000
Montreal	536,000	21,000	845,000	74,000	53,000
New York	913,000	3,387,000	1,504,000	238,000	109,000
afloat	151,000				22,000
Oswego	6,000		8,000		35,000
Peoria	22,000	64,000	35,000	9,000	10,000
Philadelphia	158,000	1,600,000	80,000		
St. Louis	421,000	783,000	91,000	16,000	12,000
afloat		176,000			
Toledo	850,000	1,485,000	39,000	94,000	
afloat					
Toronto	154,000		63,000		42,000
On Canal					
On Lakes	321,000	3,917,000	1,144,000	268,000	817,000
On Mississippi	4,000	262,000	60,000		
Grand Total	36,979,000	24,103,000	13,657,000	3,630,000	3,293,000
Corresponding Date					
1896	58,483,000	17,170,000	9,481,000	1,518,000	1,037,000



## TOWING FACILITIES.

Geo. W. Eldridge writes in the Boston Journal as follows:

"Permit me to express myself on a subject of vital importance to the maritime public.

"For years I have constructed charts and aids to navigation, and am therefore interested in everything that pertains to maritime affairs, especially in the things that relate to the safety of those who traverse the ocean, and the lives and property imperiled thereby.

"During the last four months I have kept a careful record of the many breakdowns of steamships at sea. Since December no less than 20 steamers have been disabled in mid ocean—principally by the breaking of their shafts—when on their various routes between American and European ports, the following being a correct list: Anchoria, Cotehele, Corona, Diamant, Cambrian, Lake Winnipeg, Grand Lake, Durham City, Geestmunde, Indralema, Wilkommen, Tampico, Algoa, Astrala, Sunniva, Hazelmoor, Delaware, Orthia and Valleda. This list probably exceeds anything of the kind during the same length of time since the inauguration of steam for the propulsion of ships. By reading the various accounts relative to these disabled ships, I learn that they reached port in tow of some friendly ship; but I have been profoundly impressed with the inadequate means employed or at command for successful towing by the ordinary steamship. In many instances they failed to hold and handle the disabled crafts after they had succeeded in getting a hawser to them.

In connection with this point I will instance the case of the Cambrian. This ship was first taken in tow by the steamship Vala, but subsequently parted her hawser. Next the Vala and Assyrian combined their powers to assist the Cambrian into port, and again the two were unable to accomplish the desired end and again the disabled ship was at the mercy of wind and wave. Finally she reached port in tow of the fourth ship, the Capenor.

"Now, it appears to me that in this case the means employed were totally inadequate to meet the existing emergency, that is evident, for if they had been, the first ship would have brought the Cambrian to port. To controvert this opinion, those in charge of the Vala would undoubtedly assert that the state of the wind and waves was against them, and, thereby, they lost or parted from their tow.

"Again there are difficulties and great danger attending the work of getting tow lines or hawsers from the towing to the disabled ship. Towing hawsers of steel are now used to a considerable extent, but the use and handling of them are often attended with great danger. This is proven by a case that occurred only a few days ago. The steamship Templemore broke down in mid-ocean and a sister ship, the Ulstermore, attempted to tow her. The tow line in this case was a steel rope.

"It parted, and by its recoil upon the Templemore the captain and one sailor were instantly killed, besides breaking the legs of the first officer and several seamen.

"It is well known by mariners that while a steel hawser has great strength, is compact and somewhat more easily handled than a manilla hawser, yet the metal rope lacks the elasticity of manilla, and if it parts under a heavy strain the recoil is like a thunderbolt, sweeping everything before it. Recently I have given this matter of break-downs at sea much thought, and have tried to devise some improved method whereby the towing of ships at sea can be done with greater surety and safety than by the ordinary means now employed.

"It appears to me that here is a field for invention, a fortune for some bright mechanical mind that shall devise a means or method or machine whereby the towing hawser can be attached to one or both ships, so that a proper amount of elasticity "or give in a sea way"—to use a nautical expression—shall always occur.

"I trust that this communication through the columns of the Journal may be the means of setting some practical mariners, when they shall become helpless upon the rolling brain at work to solve the problem whereby steamships can render more efficient aid to their unfortunate fellow deep.

The keel of the battleship Wisconsin has been laid at the Union Iron Works, San Francisco. The contract price is about \$3,000,000. There are two other warships of the same size being constructed in Eastern shipyards, the Alabama and Virginia. The specific features and general dimensions of the vessels are: Length of load water line, 368 feet; beam, extreme, 72 feet 2-5 inches; freeboard, forward, 13 feet 6 inches; normal displacement, 11,825 tons; main draft for the normal displacement 23 feet 6

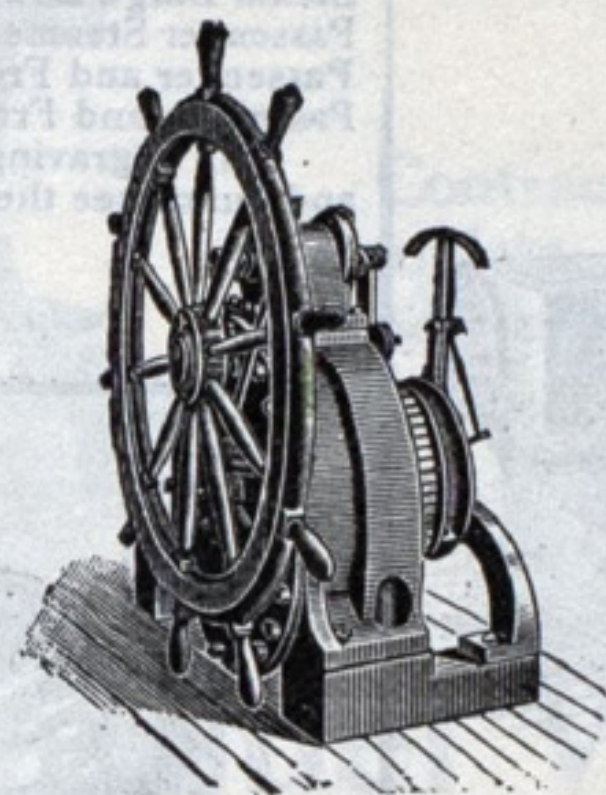
inches; I. H. P. 10,000; estimated speed, in knots per hour, 16; normal coal supply, 800 tons; total bunker supply, 1,200 tons.

## PROPOSALS.

U. S. Engineer Office, 185 Euclid avenue, Cleveland, O., April 5, 1897. Sealed proposals for reinforcing, with stone, the jetties at entrance to Port Clinton Harbor, O., will be received here until 2 o'clock P. M., standard time, May 7, 1897, and then publicly opened. Information furnished on application to Jared A. Smith, Col., Engineers.

U. S. Engineer's Office, Telephone Building, Detroit, Mich., April 17, 1897. Sealed proposals for dredging Black river, at Port Huron, Mich.; Bar at mouth of Black river, Mich.; Belle river, at Marine City, Mich., and Clinton river, Mich., will be received here until 12 o'clock noon, standard time, May 7, 1897, and then publicly opened. Apply here for information. G. J. Lydecker, Lt. Col., Engineers.

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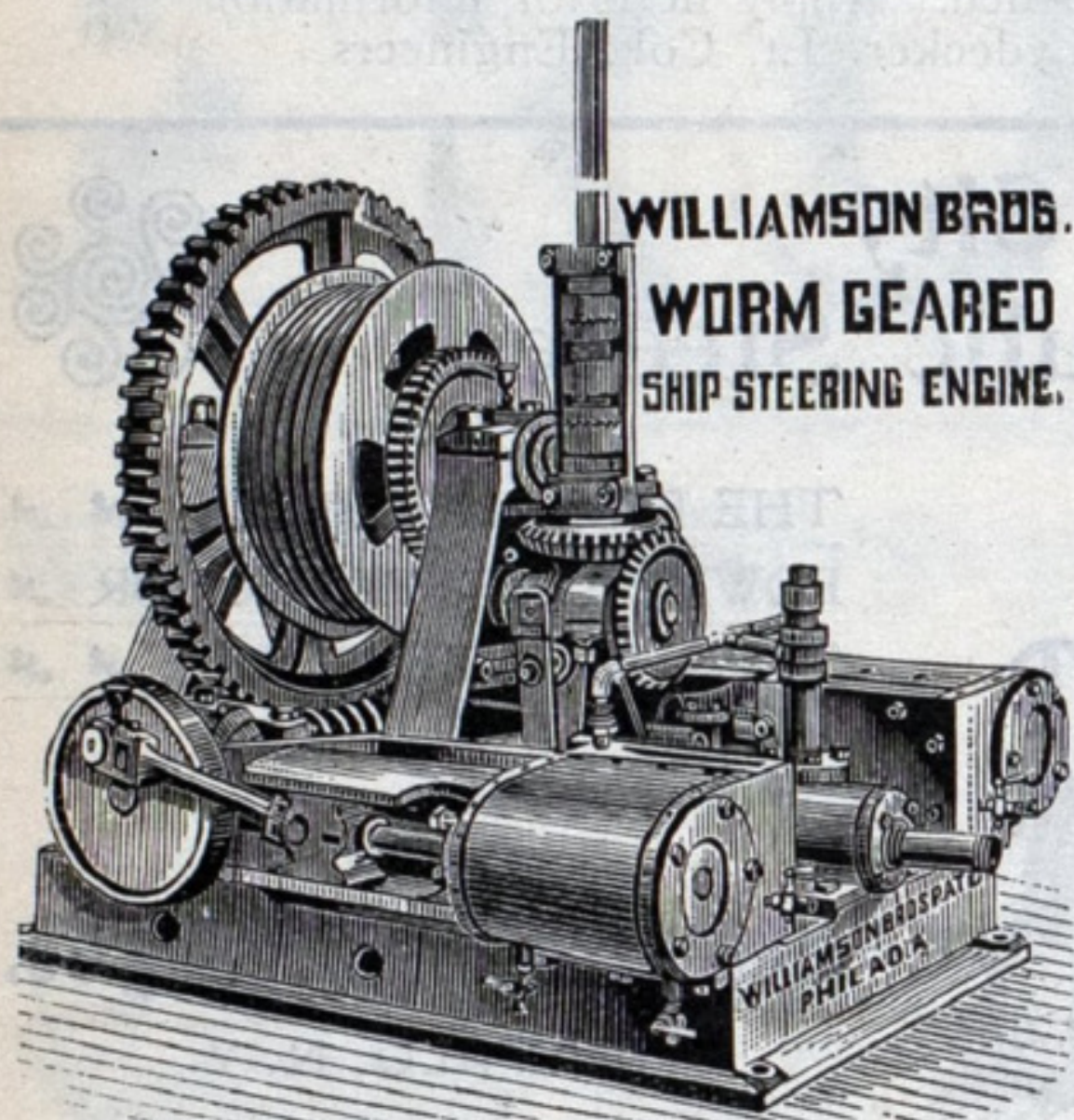
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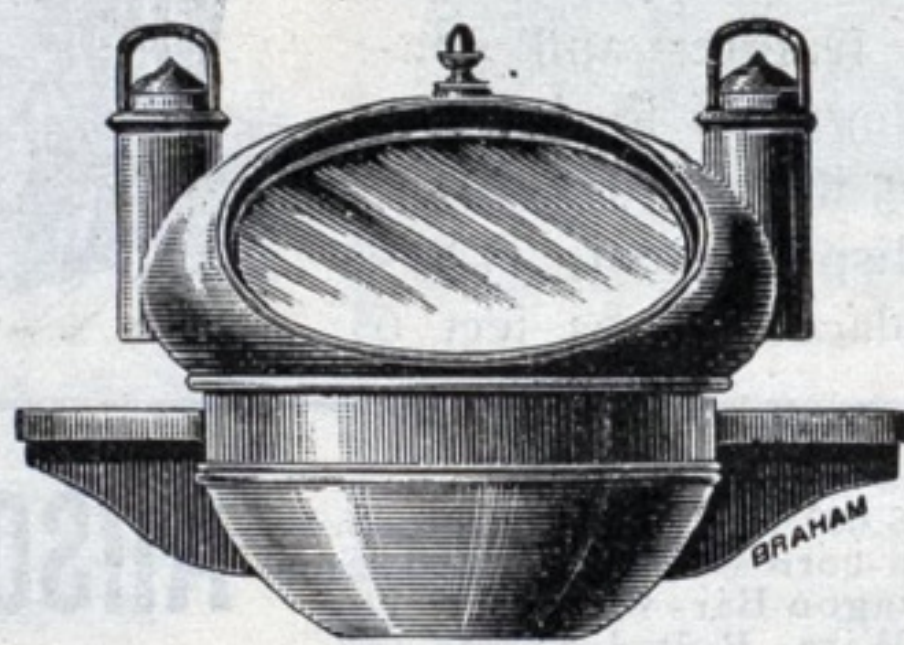
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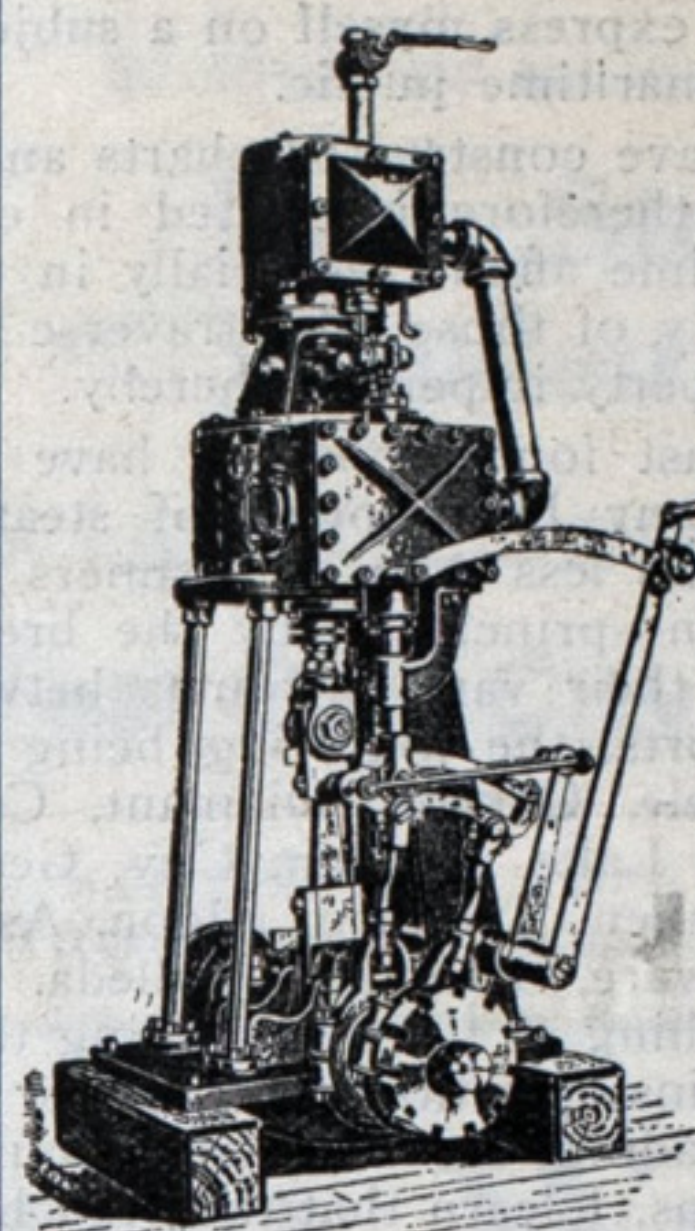
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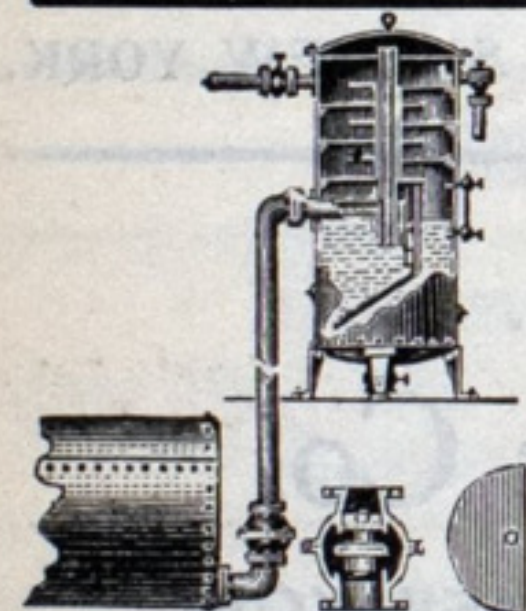
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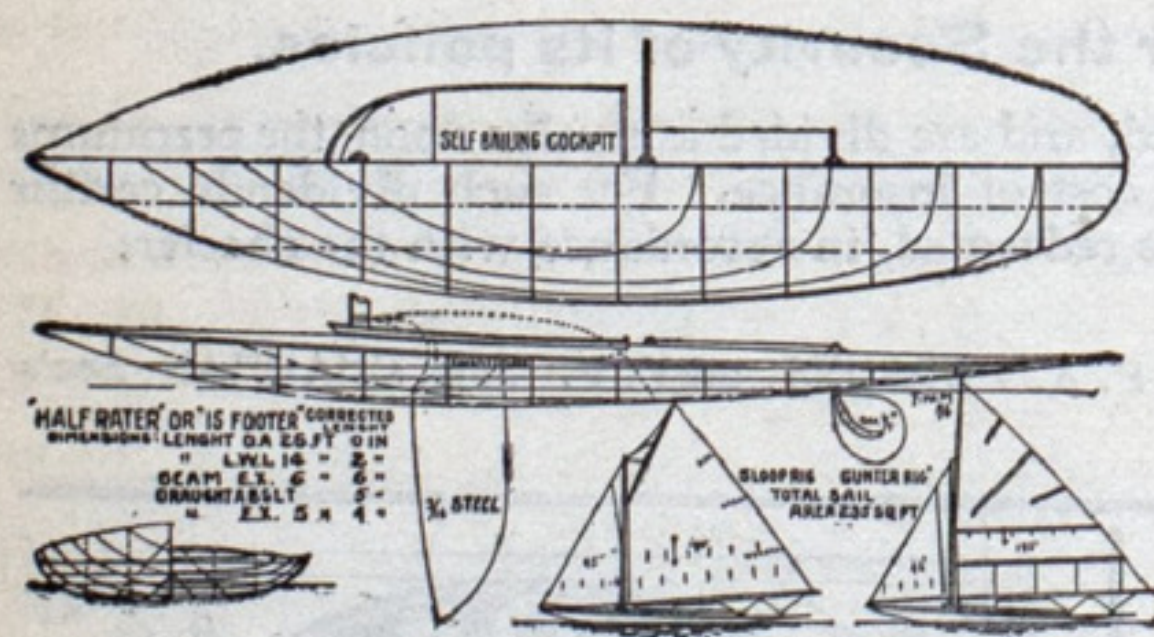
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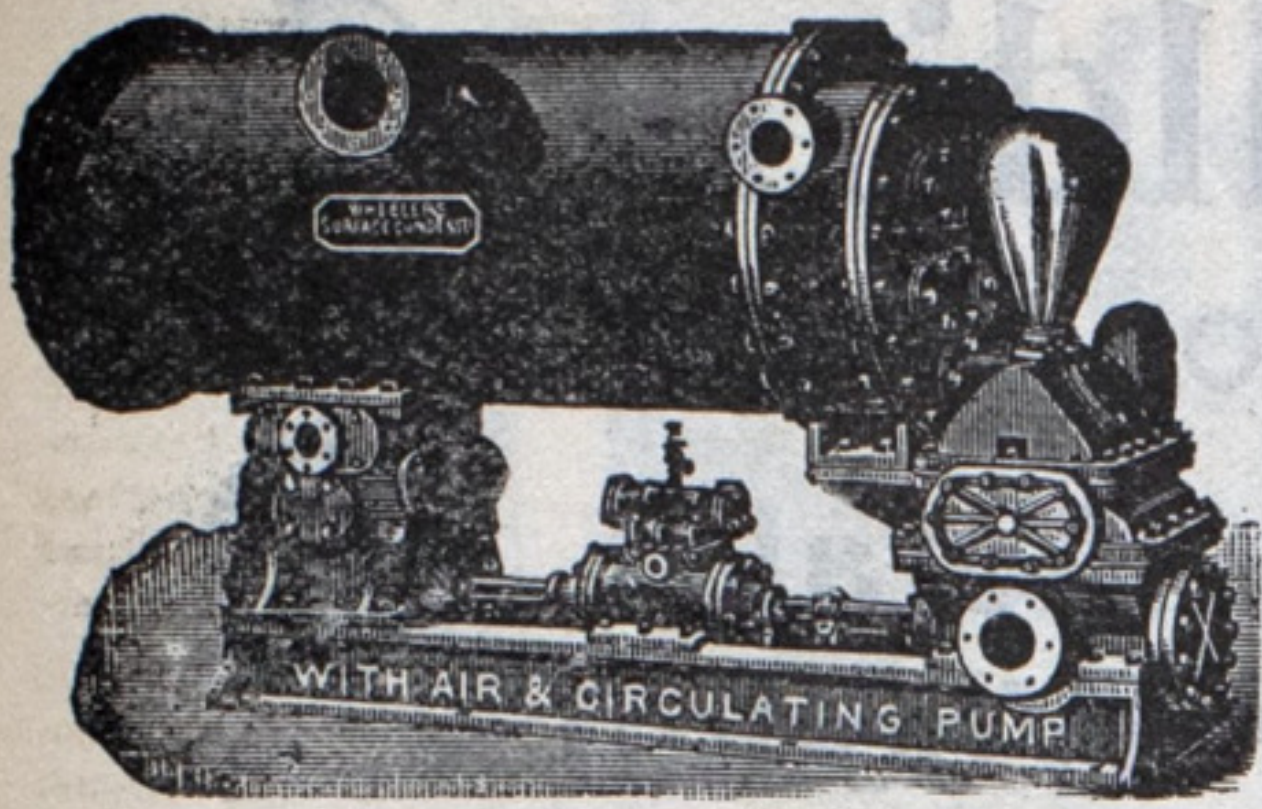
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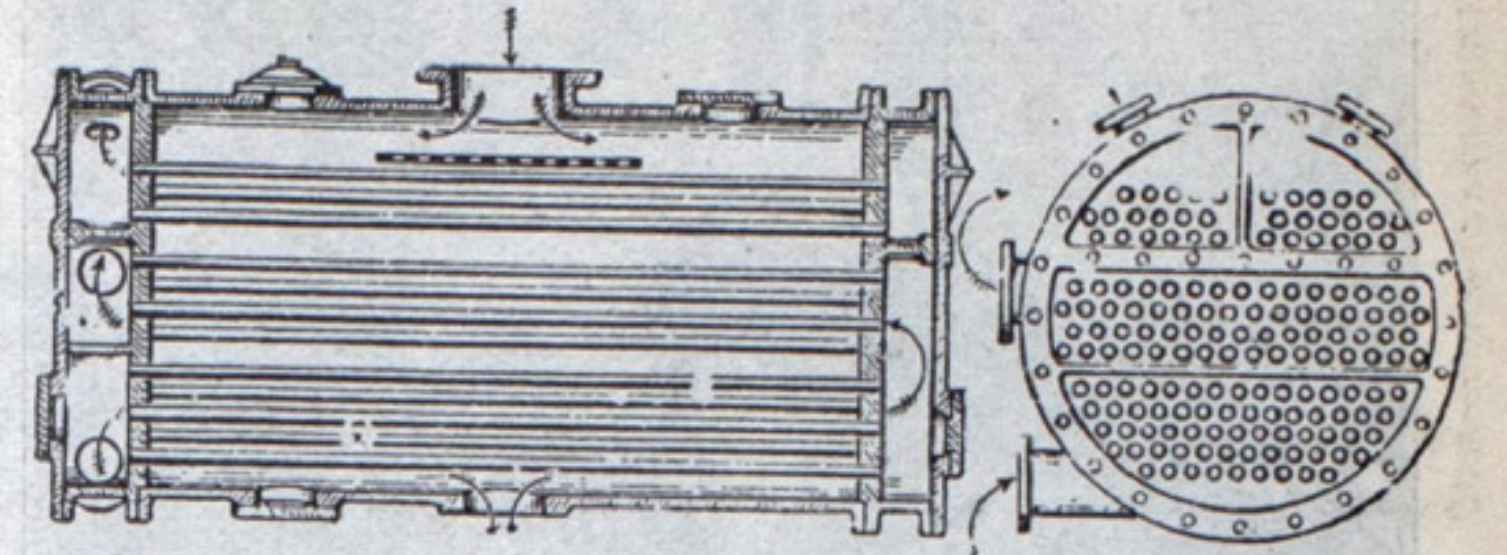
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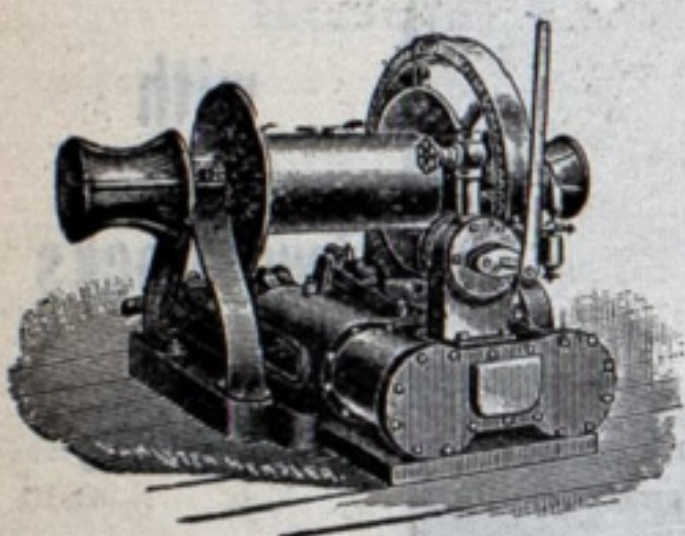
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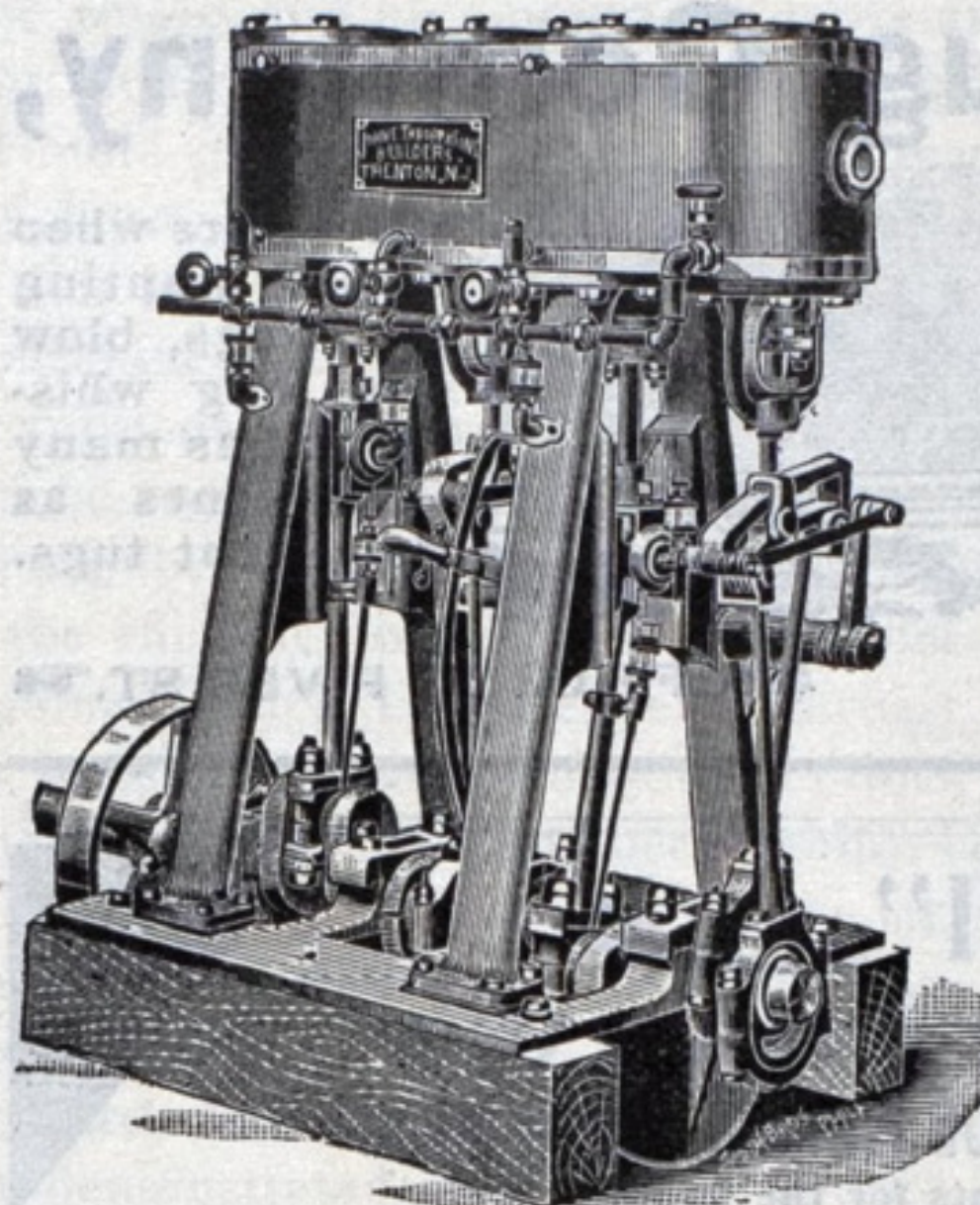
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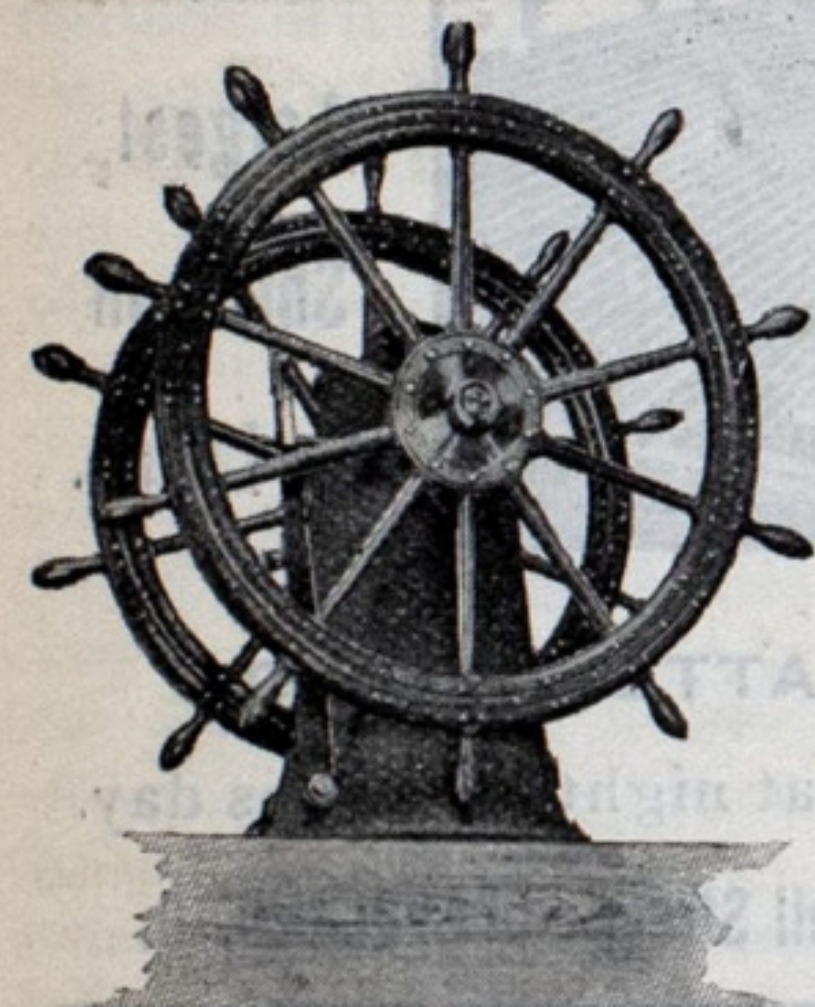


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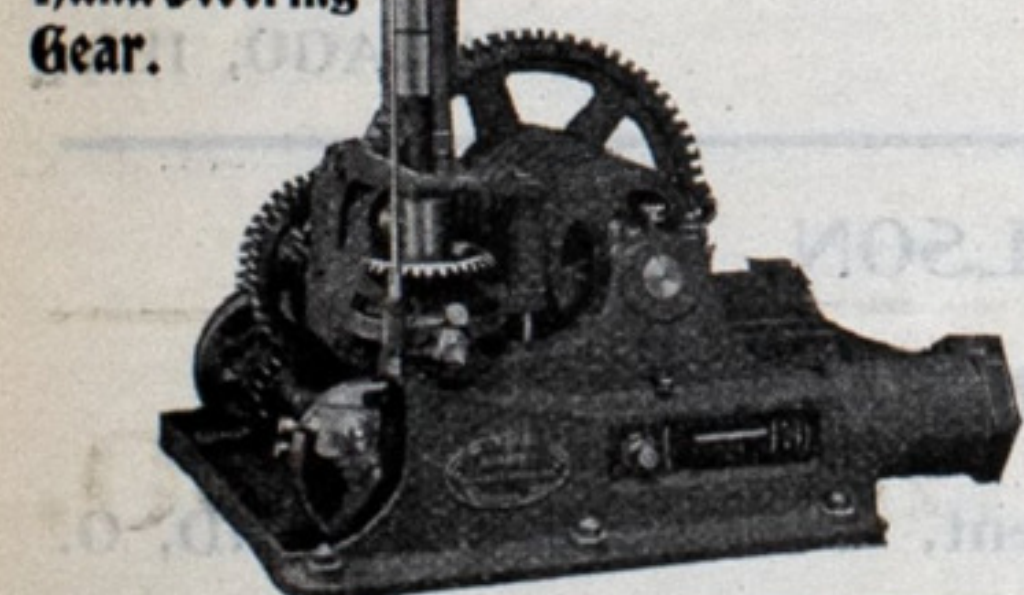
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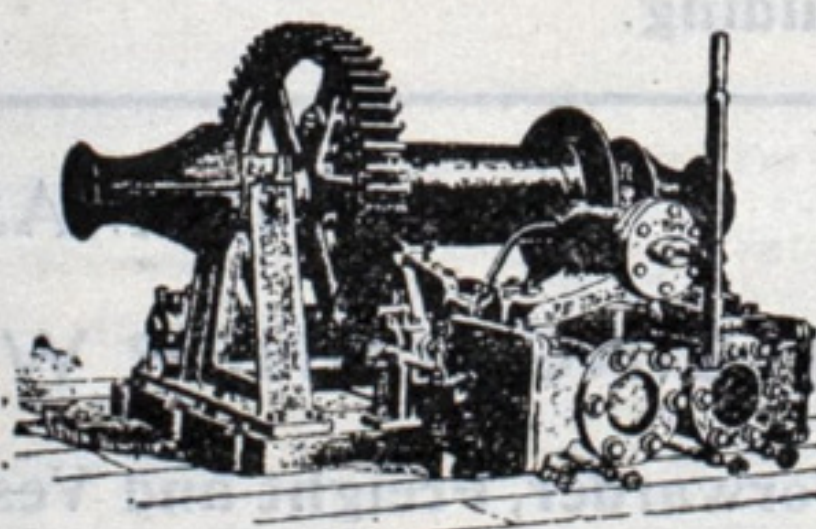
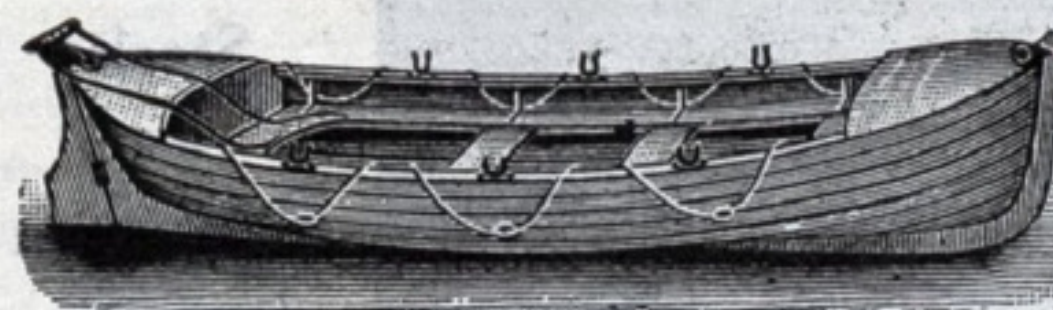


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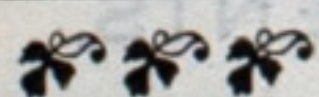
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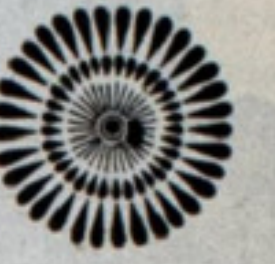
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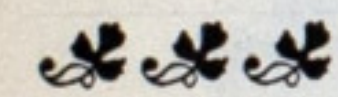
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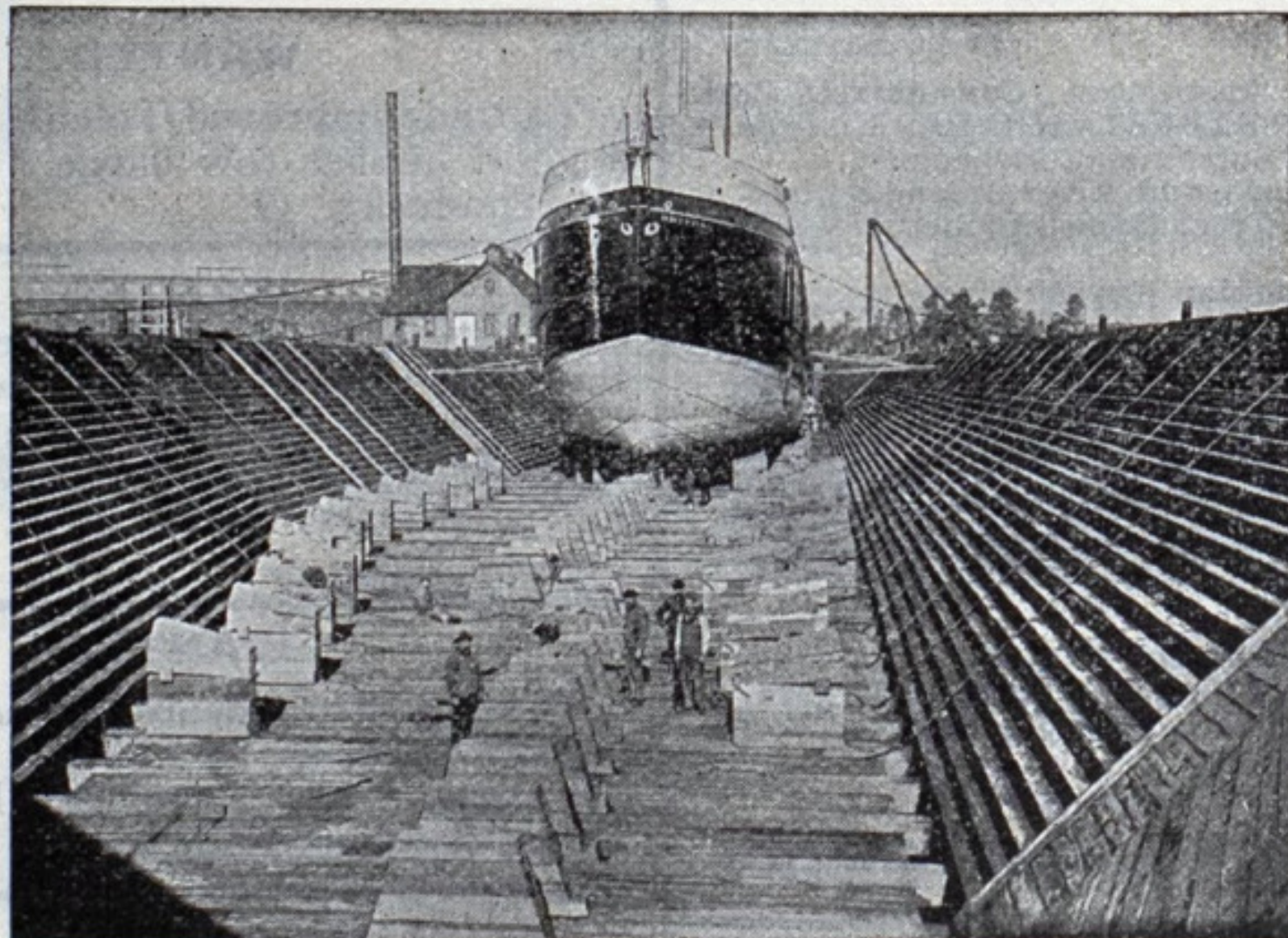
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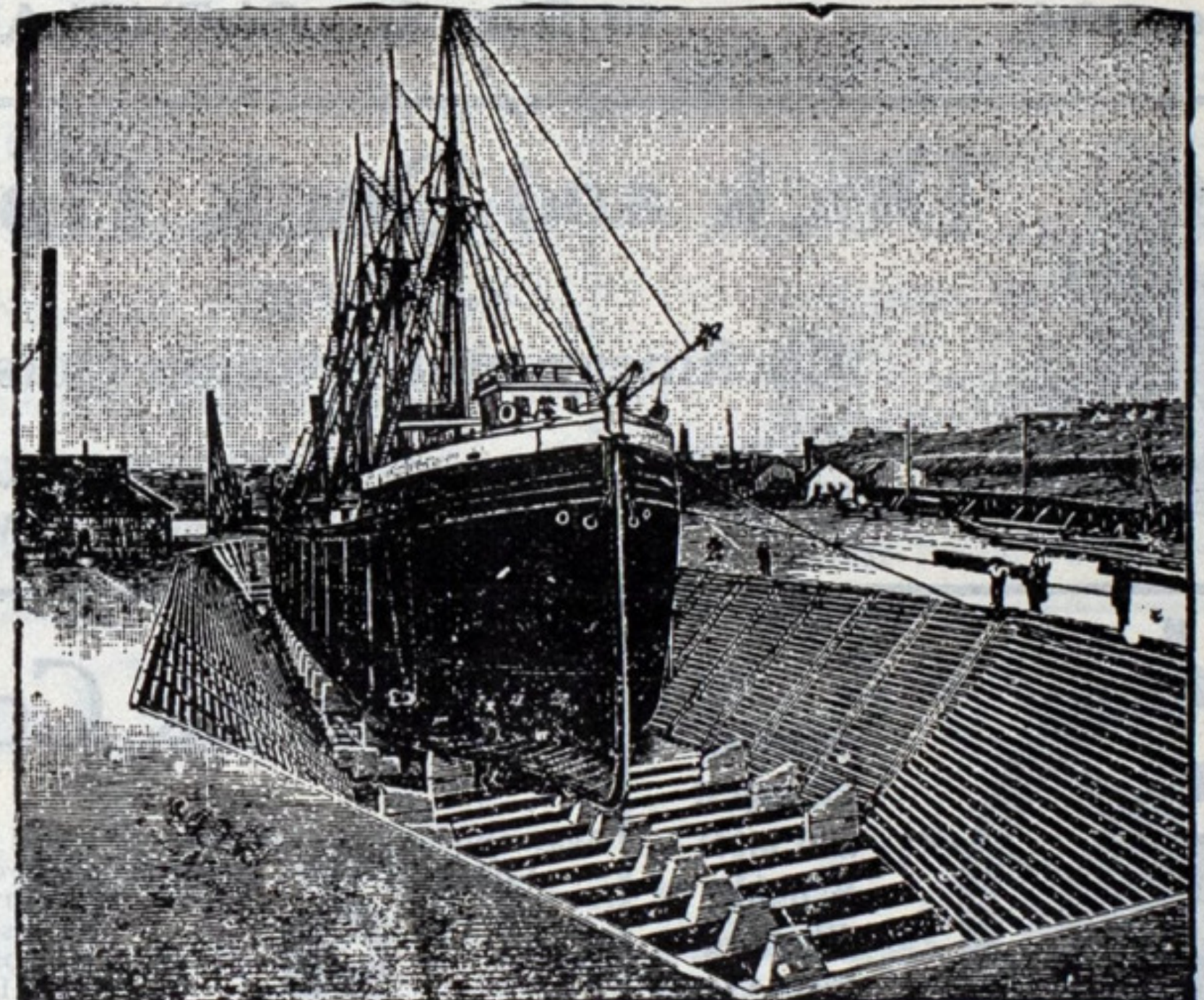
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